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[WALTON]

Llama Puntera and Llamero in his Poncho.

AN

HISTORICAL AND DESCRIPTIVE

ACCOUNT

OF THE

FOUR SPECIES

OF

PERUVIAN SHEEP,

CALLED

Carneros de la Tierra;

TO WHICH ARE ADDED,

PARTICULARS RESPECTING THE DOMESTICATION OF THE TWO WILD SPECIES,

AND THE

EXPERIMENTS

HITHERTO MADE BY THE SPANIARDS,

TO CROSS THE RESPECTIVE BREEDS, TO IMPROVE THEIR WOOLS, &c.

By WILLIAM WALTON, Jun.

LONDON:

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1811.

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Rupert-Street, Hay-Market.

TO THE RIGHT HONORABLE

LORD SHEFFIELD.

My Lord,

THAT laudable attention, which your Lordship has uniformly devoted to the improvement of English Wools, and the favorable manner in which your Lordship was pleased to express yourself, at the perusal of my first imperfect MS. on Peruvian Sheep, makes me, now, take the liberty of inscribing to your Lordship, the present little Essay, under a more complete form; in which I have entered into more extended details, and have endeavoured to shew, how far the Spaniards have gone, in their experiments to domesticate the two wild species, as well as in crossing the respective breeds; a subject that in England, may, at some future

moment, deserve national consideration, and be thought a means of improving the Merino, and South-Down Wools, by a mixture with the Vicuña and Alpaca, so as at length, to carry this staple commodity of the country, to the greatest pitch of fineness and beauty, of which it is capable, and make our fleeces rival those of the *brebis des Calmoucks*, and the goats of Syria.

In requesting your Lordship's acceptance of this little tribute of respect, I have, at the same time, an opportunity of renewing the sentiments of gratitude, and high consideration, with which I subscribe myself,

Your Lordship's,

Most obedient and devoted Servant,

WILLIAM WALTON, Junr.

London, July 10, 1811.

PREFACE.

THE fact of a beautiful Alpaca or Paco, having been in England for more than two years, in the possession of Mr. THARPE, of *Chippenham Park*, *Cambridgeshire*, and there visited by several Naturalists and Curiosos, without its being properly defined, and afterwards exhibited in Piccadilly, No. 236, (London) under the mistaken name of the *Camelo-guanaco*, so called by Dr. SHAW, in his work of General Zoology; first determined me to throw together, and arrange in some order, my own personal Observations, and the materials I had collected, in different parts of the Spanish settlements, relating to the four species of Peruvian Sheep, called *Carneros de la tierra;* particulars, originally intended, at a future period, to form part of a general description of the interesting regions, of which they are exclusively natives. This partial effort, is now published separate, and in anticipation, at the request of friends, who perused the MS.; in hopes, that it contains matter, of a nature sufficiently novel, to interest the public, and so authentic, as to relieve us from the errors under which we labour, derived from the many spurious and confused accounts of these animals, that have, at different periods, circulated in Europe.

I HAVE, however, singularly to regret, that the present interrupted communication from Buenos Ayres, to the capital

of Peru, has deprived me of the solution of several questions, I last year proposed to some of the naturalists of the country, with other particulars I solicited; as this privation has only been partially compensated, by the personal recurrence, I have been able to make to South Americans of distinction, who have lately arrived in London, but whose assistance has, nevertheless, been of the most material consequence.

INTRODUCTION.

THOUGH we have, in print, incorporated in the works of several natural historians of distinguished merit, descriptions of the four species of Peruvian Sheep, called *Carneros de la tierra*, yet it cannot be said that we have one, that may be considered accurate; for the mistakes of the first authors, have been copied by those who followed, and the confusions and misrepresentations under which they wrote, have been multiplied, into the accounts handed down to us, by successive Zoologists, who looked up to them as models, and consulted them as authorities.

BUFFON very justly observes, that though these are the common animals of a country, with which we have been acquainted, considerably more than two hundred years, yet we have no description of them that can answer our wishes; nor have the Spaniards, who had the best means, given us complete histories, or exact delineations of animals, that partake of so many interesting qualities. The French of the present day, from reasons hereafter mentioned, have now

opportunities of being fully acquainted with their generic kinds, and of what they are capable; but one would have thought, from our easier access, to the country in which they are born, that in London, at this time a day, we never could have mistaken the Alpaca for a Guanaco. The naturalists of the continent must indeed smile, when they see a drawing * of the Alpaca, with Guanaco below it; the Llama † mistaken for the Vicuña; a bad representation of the Alpaca, made to stand for the Llama, ‡ and that the public of a whole capital, have been viewing a tame and domesticated animal, under the name of a wild one.

The fact is, that the first naturalists were, in great measure, obliged to recur to the relations the Spanish conquerors, for information; that these wrote without being masters of their subject, and that often, the mistake of names, rendered their descriptions defective, and eventually lead us to confound one species, with the other. Hernandez, and Gregorio de Bolivar, are amongst the few Spaniards, who have attempted to leave us any particulars respecting them, but

* See No. 17, of the Arcana, or Museum of Nature, for May 1811, published in London.

† See No. 4, of ditto, for April 1810.

‡ See Wilcocke's Work on Buenos Ayres, and Pennant's Quadrupeds, ad verbum, Llama, figure 70, and page 133.

the first only knew the animal in New Spain, where, as in England, it is scarce, and kept as a curiosity; and what he calls by the Mexican name, *pelon-ichiall-oquilli*, must have been one of the two tame kinds, as the wild ones, could never have penetrated to that distance.*

* Dr. Francisco Hernandez was one of the first and most able botanists, who methodically compiled the natural history of New Spain, a work of seven years local research, which cost the crown 60,000 ducats. His valuable MSS. were accompanied with drawings of plants, flowers, animals, minerals, and antiquities, together with seventeen volumes of herbals, filled with dried plants, the whole of which was deposited in the royal monastery of the Escurial; the publication being deferred by the death of the author. The great fire, which in 1671 consumed many precious collections of that library, also destroyed the work of Hernandez, a loss deplored by Tournefort, Linnæus, and many other able writers. Some years afterwards, the original rough copy, was discovered in the Imperial college of the Jesuits, in Madrid, after their expulsion, in five folio volumes, in the hand writing of the author, from which the fair copy had however, been much amended and enlarged. Orders were issued by Charles the third, for the MS. being prepared for the press, and to supply the deficiency of the drawings, &c. he ordained a new botanical expedition, to form fresh collections. This mutilated work, highly honorable to the Spanish nation, was published in Madrid, soon after the accession of Charles the fourth to the crown, in five volumes; the three first, comprising the natural history of the plants of New Spain, in twenty-four books; the fourth volume, that of its quadrupeds, birds, reptiles, insects, fishes, and minerals, with notes on the productions of the Philippine islands; and the fifth, containing many interesting particulars of the rites, customs, &c. of the native Mexicans.

Bolivar seems to have been ambitious, in the opinion of Buffon, of only collecting a number of facts, relative to the natural disposition of the Llamas, and the advantages to be derived from them as beasts of burden, but he has not entered on their natural history, or viewed them in their most interesting light. Acosta * has been equally sparing in this point; and Herrera, as an historian, has not dwelt long upon them; yet we are far from thinking Garcilasso de la Vega's particulars uninteresting; or that Buffon is correct in saying, that he only speaks from other authors. He had opportunities which no predecessor had, and though he refers to Acosta, it is, that his readers may see more on the subject, but not to give authority, to what he himself had penned. Pere Feuille, in page 27, vol. 2, of his voyage, has, for the first time, undertaken their anatomy, in the dissection of a Guanaco; but we have not been able to meet with an author, who combines an historical, descriptive, and anatomical account, pointing out that the wild species can be tamed, that the breeds can be crossed, and the wools improved; nay, these facts have in general been denied. Buffon copied, and defectively, the Spaniards; Bomare imitated him; and our own authors, have

* Sp. Ed. Lib. 4. cap. 41.

stuck close to both; for none have transmitted to us, an instructive or explanatory memoir, of their habits, manners, or the resources of their wools, nor told us, to what uses they are applied in the present day.

The distinct kinds of Peruvian Sheep, called by the Spaniards, *Carneros de la tierra*, or country sheep, are four; viz. the Llama and Alpaca, domestic animals and beasts of burden, and the Huanaco and Vicuña, which are wild, and never yet tamed, but in some solitary instances. Though they all appear to be intermediate species, between the camel and the sheep, and as it were, a delicate mixture, and blending of them with the stag, yet we consider them respectively, as perfectly distinct in their genus, as is the ass from the horse, notwithstanding that alliances are made between them, so that, though their generic denomination is the same, the races are different, and differ in their perceptible characters. Without being descended from the camel, they have some marks of exterior resemblance, and are possessed of some of his properties, without having any of his deformities. The two first were, at the arrival of the Spaniards, found to be the sole beasts of burden the Indians had, yet the Alpaca was only used occasionally, and was more particularly destined to be shorn,

from the great length and fineness of its serviceable fleece. The two latter, were hunted for food, their woolly hair was also spun, and manufactured, and the skins of all served some domestic purposes, as for beds, for hose, thongs, &c. Giving the denomination of *Carneros de la tierra*, to the wild kinds, is however, rather opposed to the common acceptation of the Indians and Spaniards, but we conceive it equally attributable to them.

We consider it not only an egregious error, but an unwarrantable confusion, in the classifications of Linnæus, Buffon, and Bomare, to see the Pacos and the Vicuñas reduced to the same species, and that the Llama is supposed to be the Huanaco, domesticated; for notwithstanding it is now fully proved, but only lately, that they will intermix, yet the same peculiarity is remarkable in the camel and the dromedary, in the sheep and the goat---in the ass and the horse ---in the wolf and the dog*---yet they are all

* In the year 1804, it was proved in the Tower of London, that the dog and the wolf would intermix. The dog wolf, had offspring by an English bitch, but no breed was obtained by crossing with a mastiff, and the she wolf. The wolf used on this occasion, was a tame Mexican animal, presented by the Spanish Admiral Massaredo, to Lord St. Vincent, at the time he was blockading Cadiz; and these experiments have been carried to much greater length, by the late learned Dr. Hunter.

distinct and separate species, and have nothing whatever that amounts to a specific identity, or that respectively proves them, to be descended from any parent stock. But Bomare has gone further, in his *Dictionaire raisonné universel, d'Histoire naturelle*, vol. 10, ad verbum Paco, the whole four species are confounded under the same article, perfectly blended together; and a similar confusion is also remarkable, in the particulars given in Molina's Chili.

It would be difficult, at this advanced period, to say, from whence the Indians obtained their two domestic animals, as they are not found at present, in their natural and wild state, but at the same time, it would be absurd to argue, that they had been able to raise the wild animals of their secluded mountains, into two distinct species, with other properties, had given them nearly double size, and out of the short woolly hair of the Vicuña, had given to the Alpaca, a long, lank hair, when it must nevertheless be confessed, that the Aborigines had no idea of crossing the breed, and that the Jesuits were the first, who ever attempted to domesticate the wild kinds.

The camel, that certainly constitutes one of the most useful animals under the subordination of man, is not now found in its natural or wild

state, and it becomes an equal problem whence the Arabians first obtained him. It is a principle in Zoology, laid down by Buffon, that "domestic animals, in very few respects resemble wild ones; their nature, size, and form, are less constant, and are more subject to changes, especially in the exterior parts of the body," and this is perfectly evinced in the four genera of Peruvian Sheep. For many substantial reasons, the wild animal, reduced to a state of domesticity, unless aided by foreign connection, loses its strength and size, it becomes weakened and degenerate, often impaired and deformed; but the authors who derive the Llama from the Huanaco, never took this into consideration, for the domestic animal is here, on the contrary, much larger, stronger, much more beautiful, has opposite properties, is not so fleet; yet this is owing perhaps to its state of servility, but it leaps with equal activity. The Huanaco has only one colour, the Llama has many; the Vicuña has only been discovered chesnut and white, whereas the Paco is brown, purple, and as often black as any other colour, as we shall more particularly notice, in their separate descriptions. This difference of colour, may however have been occasioned by the operations of nature, and a variety of other causes, for the French naturalist, above quoted, allows, that

"the influence of climate acts with more force upon captive animals, than on free ones, and that food prepared by the hand of man, oftentimes ill chosen, and given scantily, joined to the inclemency of a foreign sky, in time produces alterations, sufficiently deep to become constant, to be perpetuated from one generation to the other, and paints them with various colours," &c.

This cannot however be applicable to the domestic Peruvian cattle; the hand of man never prepares their food, they seek and find it instinctively, on their native mountains; yet the difference of colour is nevertheless noted in the regions of an equal elevation to those, in which the wild ones dwell. If their state of domesticity had been the work of time, from their great opportunities of returning to their independent mountains, we should find them flying from the trammels of restraint; or rather, if they belonged to the same family as the wild ones, that often pasture on the same declivities, at one certain season of the year, they would naturally be propelled in search of them, and court them as a congenial species. The extended and secluded forests, and the untrodden ranges of such a country as South America, naturally incline the domestic animal to turn wild; for which reason, all the imported kinds, as they have procreated,

have extended their bounds, in pursuit of food and drink, at length becoming inhabitants of the wilds, and throwing off every restraint imposed on them, by the previous empire of man. This does not appear however, to be the natural disposition of the Llama and the Paco, for like sheep, they seem to require to be the familiars of the cottage, and its inmates, and are so completely enslaved by man, and resigned to their state, that they are no longer fitted for any other.

It is a fact, supported by the Mercurio Peruano, and connected with the botany, as well as the natural history of Peru, notwithstanding it has not before been adverted to by naturalists, that, although the *Carneros de la tierra*, are natives of the lofty mountains, which extend under the denomination of Cordilleras, as far as ten degrees of North latitude, with pretty near the same elevation, cold, &c.; these animals do not pass beyond the line, towards the North, of consequence are not found native in Quito, Santa Fè, Caracas, &c. where the climate of the mountains is at least analagous to that of high Peru, regions in which the animals in question live naturally, and multiply their species.

The sole reason, in the opinion of the *Sociedad de los amantes del Pais*, of Lima, that can be adduced to account for this extraordinary

circumstance, is, that through the whole extent of the northern regions of the Cordillera, a kind of pasture, which the Peruvian naturalists call *ycho*, or *ychu*, denominated by the authors of the Flora Peruana, Jarava,* is not to be found. This plant belongs to the gramineous tribe, and appears to be the natural food, of the Vicuñas and Huanacos. It is extremely abundant in the mountains of Peru; but in those of Quito, Santa Fe, &c. naturalists have not ascertained that it is to be met with. The deduction that hence follows, would establish, that it is a plant, extending from the Equator to the South; for as far as the extremes of the Patagonian coast, the Huanaco is found, is eaten by the natives, and has penetrated to regions, where neither the

* JARAVA YCHU,

Class. Monandria Digynia.

Cal. Gluma uniflora, bivalvis, valvulis erectis, lineari-subulatis, canaliculis inequalibus, scariosis, pelucidis persistentibus.

Cor. Gluma univalvis, convoluta apice, pilosa, pappiformis, calycinis valvulis minor, terminata arista, calyce duplo longiori, inferne tortili.

Stam. Filamentum unicum, capilare longitudine stigmatum; Anthera oblonga utrinque furcata.

Pist. Germen oblongum minimum. Styli duo, brevissimi. Stigmata plumosa altero paulo longiore.

Per. Gluma corolæ semen involvens.

Sem. Unicum oblongum.

Flora Peruana, ad verbum Jarava.

wild horse, or cow, have passed, obstructed as it is supposed, by the deep and rapid rivers, that intervene.

They, therefore, appear to find, a congenial climate, in the most elevated regions of the terrestial globe, and seem to require the respiration of an air, more light and pure, than other animals; which is nevertheless more remarkable in the two wild kinds, for the domestic ones, were found in Cusco, Arica, and other parts of lower Peru, where they thrived, and underwent the fatigue of the road, without pining, or receiving any injury. Yet, we cannot refrain, from expressing as our opinion, that the Huanacos and Vicuñas, court the snowy summits, more from the moss, soft short grass, and the peculiar plant, above alluded to, as well as from their greater congenial solitude and security, than from any peculiar qualities of the atmosphere.

We are at a loss, to judge, from what authority, Buffon asserts, that the Llama and Paco, were domestics in Mexico and Chili, as well as in Peru, "the same as horses are in Europe, or camels in Arabia," but there cannot be a doubt, of these two kinds, being originally exclusive to Peru, from whence the Paco only has got to Chili; for we can safely assert, that there is as much communication between Peru and

New Spain, as between either and Russia, and that though some small vessels have occaionally traded from Lima and Guayaquil, to Acapulco. which must be the point of contact to Mexico, for nobody ever went there, direct by land; we cannot be induced to think, they were at any time, articles of traffic, for both in Lima and Guayaquil, they are nearly as great objects of curiosity, as in England or France, indeed they are even so, at Buenos Ayres. Most authors agree, that the ancient Mexicans and Peruvians, had no communication with each other, and therefore could not have exchanged each others productions; for in the list of quadrupeds, which Montezuma had for his recreation, we do not recollect that any species of the Peruvian sheep, are mentioned; nor does Clavajero seem to have known them.

It is much to be regretted, that we have no new treatise, on American quadrupeds; the naturalists of Europe, have, as before observed, multiplied amongst their works, so many mistakes for want of correct data, that they now mislead, more than instruct; and though the literati of the age, are under the greatest obligations to Azara, for pointing out Buffon's defects and omissions, in his descriptions of the birds of that continent, yet it is a disgrace to the crowned heads and literary societies of Europe, that they

contribute so little, to our more perfect acquaintance with it; those days appear to be gone by, in which rank and dignity, were emulous to extend the pale of human knowledge, and to make us familiar with the unknown regions, of the same globe, which we ourselves inhabit. Though these are countries now more open to us, than they were lately to the French, we have not a naturalist or botanist who has entered them, notwithstandng, that besides objects of curiosity, they contain so many unknown materials of manufacture, and so many means to improve our tints.

With regard to Mr. Buffon's assertions respecting Chili, we know of no Spanish author, who mentions their use of the Llama, but at present we are convinced, that they only know it by name. The Chileños and Araucanos, had indeed what they call the Chilihueque, or Chili Sheep, which we have no doubt is the same animal as the Alpaca of Peru, in a more degenerated state, and according to Molina, they used it as a beast of burden, in a manner not adopted by the Peruvians, which was, by passing a thong through the rim of the ear, to serve as a bridle. Since the multiplication of mules, they are now unknown as beasts of burden, and are only bred by the Araucanos for their fleeces, who prize no other than the black ones. The

Huanaco and Vicuña have, indeed, penetrated in their wild state, as far as Chili, and as the Indians imagine, over the wilds of Atacama, which intervene between Peru, but they are only hunted for food, and to obtain their skins.

We will now proceed to the separate and distinct description of each species, commencing with the Llama, which is the largest, and most esteemed as a beast of burden, by the ancient Peruvians, and descending, by their natural gradation, to the Vicuña, which is the smallest. As, besides the original and novel matter, on which we have been able to found ourselves, we have recurred to every thing respectable we know of, printed on the subject, in the various European languages, particularly Spanish, we entertain some hopes, that our little treatise, may help to fix the opinions of the public, respecting animals of so interesting a nature, and clear up the confusions that exist; to which the drawings of each, copied faithfully from nature, will not in a little contribute. We, must however, confess, that we have been extremely free, in animadverting to the defects of some of our most respectable Zoologists, who have written on Peruvian Sheep; but these animals have been so much misrepresented and confused, that if the descriptions of some of these gentlemen, could

be represented by drawings, a beautiful and delicate limbed race of quadrupeds, would appear like so many monsters, and indeed the figures that have generally accompanied them, have, in most instances, conveyed the idea of little less. We feel, nevertheless, confident in the conviction, that nothing but a wish to elucidate the subject, has drawn us into the following remarks; for it must be allowed in candour, that no leisure moments could be expended with more propriety, or no endeavours be more laudable, than those which have for object, to point out new resources of national wealth, and to aid to our acquaintance, with so interesting, but long neglected a continent, as that of South America.

Llama.

THE LLAMA.

THE *Llama* of the Spaniards; the *Huanacù-Llama* of the Peruvians; the *Ovis Peruana* of Hernandez, and of Marcgrave; the *Camelus-Glama, dorso lævi, topho pectorali*, of Linnæus; the *Camelus pilis brevissimis*, and the *Chameau du Perou* of Brisson; the *Allo-Camelus* of Scaliger; the *Ovis Indica* of Gesner; is considerably the largest, strongest, and stoutest of all the four species of Peruvian sheep, and is equal to the burden of 4 arrobas (100lbs.) which the Indians are careful not to exceed; though for a short distance and over good roads, they may occasionally put on him, 112 or 115lbs; but how Buffon could have been so much misled, in the strength of this animal, as to say, that he carried 250lbs. is incredible, when this is even more than the common load of an ass.

THE size of the Llama, exhibited in Piccadilly, of which the annexed figure is a drawing, is three feet ten inches in height, and three feet three inches, from the pit of the chest, to the rump. The ordinary stature of the Llama is, however, from four to four and a half, some-

times five feet; the length of the body about the same proportion, and though not near so corpulent, he may be said to stand as high, as the common Castilian ass. Garcilasso says, they are of the height of a Spanish deer, or the third of a camel. From his long neck, lofty head, and straight extended gait, he appears taller than he really is, particularly in his habitual act of stretching; and we are at a loss to account for the few specimens seen in England, being so small; a peculiarity equally remarked here by natives of Peru; unless it is, that they have pined, or have been taken away very young from their native climate, and congenial food; yet, from being cramped by confinement, they appear to disadvantage. We have, nevertheless, at the same time, noticed, that the wool had improved, which we by no means expected, from the age of their fleeces; for when annually shorn, they have a smaller proportion of hair mixed in them; and this may be esteemed a favourable augery.

The word *Llama*, amongst the ancient Peruvians, was the general term given to the two tame kinds, and signifies *Cattle;* the shepherd was called, *Llama-michec*, or tender of cattle, but now the Spaniards call him, *Llamero*. Garcilasso de la Vega,* says, that for the sake of

* Edit. Lisboa, 1609. Coment. Real. Lib. 8, cap. 16, pag. 213.

distinction, and in consequence of marks of exterior resemblance, the domestic animal, or Llama, was called *Huanakù-Llama*, after the wild one, *Huanakù*, from which it only differs in size, sometimes colour, arched back, and some peculiar properties. This was not from there being any affinity between them, but it may perhaps have given rise to the confusions that afterwards originated in Europe, with regard to these two distinct races. The Peruvians also called the Alpaca, *Paco-Llama*, but this had no reference whatever to the Vicuña, yet between these likewise, the same confusions have occurred. We have, however, consulted Peruvians, well acquainted with their own language, who assure us, that the Quechua tongue will not admit of this denomination; and though the idiom has in nothing changed, notwithstanding those words and ideas, which they had not amongst them, previous to the arrival of their conquerors, have been adopted into it, this distinction is now unknown. The Spaniards at first, denominated them, *ganado maior y menor*, (larger and smaller cattle) and this term was preserved by Garcilasso, but has also been laid aside, as their own procreated, and became in more general use.

By the French naturalists, this species of animal is defined, *sans cornes, bisulce, ruminant*,

et portant laine,* and we may add *cornipede*. Without horns, divided hoof, ruminating, bear-wool, and cornipede.

The eyes of the Llama, are large, entirely black, rather oblong, the pupil prominent, soft and expressive. The muzzle is a little lengthy, somewhat pointed; the snout dark or mouse coloured, the nostrils dilated, situated considerably above the end of the snout, the upper lip fent, like the camel, or the hare, with a perfect space between, through which the fore-teeth are seen, when the animal feeds; but the under lip is rather pendulous. No incisive or canine teeth, are found in the upper jaw, but there are six incisive, and two canine, in the lower; the centre part of which, as we have just noticed, appears through the fissure of the upper lip, and the upper fore-gums, in the act of mastication, work within, but they are not black, like those of the Alpaca; five grinders are also inserted, on the two sides, of each mandible.

When in active motion, he generally carries his ears erect, in the attitude of a horse that is alarmed, but when lying down, they hang backwards, a little couched, and in this position he places them, when he expresses resentment.

* Bomare. Dic d'His. Nat. Rais. ad verbum, Paco.

The ears are pointed, four inches long, the edges rather tipped with white, but most hairy within. The head is covered with a soft, mouse-coloured down, very short and fine towards the end of the muzzle. The neck is from 2, to $2\frac{1}{2}$ feet long, slender, arched, its motion partakes greatly of that of the swan, but he is partly, according to the jockey term, yaw-necked.

The body a little resembles, in shape, that of the fallow deer, but tapers greatly at the loins, so as to produce a very small waist, that appears to prolong under the two haunches, like that of a greyhound. The Llama we measured, was 3 feet, $6\frac{1}{2}$ inches round, by the fore legs, 4 feet, 2 inches, in the middle, and only 2 feet 10 inches in the waist, under the haunches. Both the shoulder blade, and hip bones, are very near together, and do not even appear, 3 inches apart.

He is extremely clean limbed, a merit, which Pennant and Dr. Shaw in their drawings, have by no means attributed to him; for they have loaded the hind legs, with hunches and locks of hair, that do not exist, and the proportions are little less, than preposterous. The hoof is cleft in two, most above, and the fore parts, are armed with two indurated, black, horny, hooked spurs, resembling the talons of a bird of prey, that

serve to support him, on the flakes of frozen and slippery snow, that cover the pendant sides of his native mountains, but he has no spur on the hind part of the leg, as has been falsely asserted, by most authors. His feet are proportionably much larger, and flatter, underneath than any of the other three species, and when playful, one of his antic tricks, is to bite them. The sole of the foot is a soft substance, rather round, and from the fetlock joint, downwards, there is great pliability.

Below the breast, upon the sternum, is a callosity, or flake of a horny substance, perfectly flat, oblong, about 6 inches long, and 3 wide, as in the camel, but which Pennant, and after him Dr. Shaw, has wrongly called a protuberance. On this he rests, for when he lies down, as he bends his legs under him, his body falls and is received on this substance, with a sensible noise; but in the various animals of this genus, we have had an opportunity of examining, we never could discover, that any greasy exudation issued from this excressence, as most writers affirm.* We are nevertheless confident, from the loose situation in which we have felt it, that it peels off periodically, perhaps annually.

* Viagero universal, ad verb. Chili, pag. 277. Pennant's Quadrupeds, page 134. Dr. Shaw, and others.

This callosity would almost amount to a distinctive mark of nature, that this animal was destined as a beast of burden, and had been bestowed upon the American continent, for the same purposes as the camel to the natives of Arabia. If overloaded, or tired, the Llama rests on it upright, and is never in danger of voiding his panniers, if they are only well poised, and usually when ruminating, or asleep, it serves as his support.

In the Arabian drudge, Buffon gives as his opinion, that these indurations are the effects of excessive restraint and pain, from being often found filled with pus; but without contradicting the assertion of so great a Zoologist, we express a doubt of this being the case with the Peruvian Sheep, for they appear on the young when born, and the resting position on them, is natural to a suckling. We consider it rather, a providential guard of nature, that the breast may receive no injury, when it comes in contact with the hard, and often flinty ground; or that the cold and icy flakes of snow, on which he often rests, may not strike numbness to so delicate a part of the body, as the chest. It is in fact, a guard, as is the hoof to the foot. Although the skin, in front of the knees, is extremely hard, and thicker than in other parts, the legs are no where

deformed, by any other callosities, as are those of the Camel. On each side of the hind legs on the pastern joint, a little below the knee, are two long flat corns, opposite each other, but they by no means disfigure the shape of the limb, and resemble greatly those of a horse, on the inside of the leg, below the hock.

The tail is 8 or 10 inches long, the fleshy part much smaller than that of a sheep, and covered with wool, and hair mixed, but mostly the latter. Its position, is by no means erect, but depends, in great measure, on the quiet, or active state, in which the animal is viewed. When bounding in his pasture grounds, like the horse, he carries it a little out, the position we have given to our figure, but when ruminating, or under restraint, the tail lies close. This is a part of the animal, that has been grossly represented by most authors, and Pennant's figure of the Llama, conveys no other idea of its tail, than that of the head of a mop, stuck on his rump. Though it is provided with a small switch of straggling hairs, he does not appear to use it, as a defence against the bites of insects; he chases them away, by kicking that part, where they may have fastened.

The whole body, is covered with a soft, woolly coat of hair, that does not nevertheless

curl, or drop off, like that of the Camel; and if it is old on the back of the animal, which is usual from those being destined to carry burdens, seldom being shorn; the hair is seen distinctly, to out-top the softer wool, that adheres nearer to the skin; in which case it measures from 2, to 3, and occasionally 4 inches. The most, and finest wool, as well as the least mixed with hair, is on the back and rump of the animal, though we have observed, that this is partly owing to his very frequently bending back his neck, and plucking the most exterior out with his teeth, which he eats; and this we conceive gives rise to the hair-balls, frequently found in them, of which we shall take some notice, in the body of this essay. The longest hair, is found on the flank, and on the centre part of the belly, for at the two extremes, between the legs, considerable spaces are bare.

The common colour of the Llama, is a light brown, but it is also noticed dun, grey, sometimes inclining to purple, very seldom black, or party-coloured; indeed, almost all the colours remarkable in the horse, are found in the Llama, but under the belly he is uniformly white, so much so, that the shearer makes a separate lot of what he there deprives him of; or what is most commonly the case, he does not clip it at all. The

fleece of the whole four species, is divested of that greasy quality peculiar to the sheep, and does not, of consequence, require the process of fuller's earth; nor does it emit a disagreeable smell, as Frezier and his copyists assert. This must have been acquired from the carriage of the *Guano*, in Arica, where our French traveller saw them; for there are no more cleanly animals in the world, and with less inoffensiveness attached to them; but the asslike "black stripe," along the ridge of the back, attributed by Dr. Shaw, and others, is yet more unaccountable.

The softness and abundance of the Llama's coat, makes a pack-saddle under the load, unnecessary; and this convenience, added to the overstock of other wools, induces his Indian master, seldom to rob him of his natural cloathing. For this reason it becomes more mixed with hair than the Alpaca's, and the Llama, being naturally a rougher and coarser animal than the Vicuña, and more exposed to a hot climate, which has the effect of producing hair, his fleece is not esteemed so valuable; but there are spots on the back, and rump, where wool might be picked, that would rival that of the Vicuña. The Llamas working in the mines, are never shorn, except the year before they are applied to that labour, but this operation is performed on the females,

which are kept for breeding. Their fleeces manufacture excellent blankets, friezes, and coarse woollens, which are warm, durable, and admit of a good dye.

From the peculiar formation of the genital parts, the male Llama, like the Camel, is retromingent, to which, the arched shape of the belly greatly contributes. The female has also great vulvular obstructions; and here nature, which in general operates by the most simple and easy means, appears to have deviated from her general plan, in the corporeal construction of this animal, leaving him partly dependant on the aid and protection of man.

Notwithstanding the phlegmatic disposition of the Llama, he is extremely ardent and lascivious, at the rutting season of the year. This generally occurs about the middle of spring, or as the summer approaches,* which, in Peru, is at a different period to ours. In that country, the four seasons of the year, are only observable to the nice enquirer into nature, by the phænomena produced by the sun, as he approaches, or recedes, from their hemisphere. The commencement of spring, is indicated by the equinox of September, when every thing announces, that

* When Molina says, that the rutting season is at the end of Summer, he must have meant the Summer of Europe.

the star of day returns to those regions, he had, for a time, forsaken. Towards October, the whole of nature appears in motion, vegetation assumes a new form, earthquakes, and the eruptions of volcanoes are felt, and the electricity of the atmosphere, is marked by lightnings from the North. Every production glows as it were, with a new fire; animals are impelled by an active and fresh stimulus, to the conservation of their own species, and even the imagination of man, as a living philosopher of Lima * says, acquires a renovated degree of vehemence and energy.

Thus whilst in Europe, nature seems to be in repose, whilst all her productions are buried in gloom, and her naked empire spread around us, in Peru, she is acting in full vigour, and carrying on the great works of her wise and ineffable plan.† It is then, that the Llama receives a degree of respite; it is unsafe to put a burden on his back, indeed, dangerous, for one not accustomed to handle him, to thwart his wishes, or to attempt to control him.

It will be here proper to premise, that the intermarriage of the two sexes, is to this day, one of the most solemn and splendid feasts, the In-

* Dr. Unanue. Treatise on the climate of Lima. 1806.

† In Peru, the Summer Solstice commences about the 21st of December.

dians have, particularly the Aimaraes tribes, and equals our sheep-shearing, or harvest-home. The villagers assemble; haunches of kid Llama, Huanaco, and Vicuña are roasted; *cuyes*, or country rabbits, are stewed with rice and axi;* copious libations of chicha,† go round; and in the evening, dances and amusements close the feast. The herds of Llamas have been collected, and the males separated from the females, by inclosures. Gaily dressed in new ponchos and ribbons, the *Llameros* prepare a number of smaller folds, in which they shut up one of each species. The male, commences his caresses, by a variety of antic tricks and boundings; the female groans and moans, and each spits at the other. The female, with her fore legs bent under her, and resting on her breast, awaits the embraces of her mate, but as we have before ob-

* Capsicum vulgare, or piper Indicum vulgatissimum, derived from the Greek word, κα'πιω which signifies to bite. It was called *axi* by the Peruvians, *chilli* by the Mexicans, by the Spaniards *pimiento*, by the French *piments de guinee*, and in the English islands, *red peppers*. Eleven kinds are known in South America, that vary in size, shape, and pungency. About 30,000 arrobas of these dried peppers, go annually from the provinces of Peru, into those of Buenos Ayres, grown in Arequipa, Arica, and Camanà.

† Chicha is a strong beer, made of boiled and fermented maize; this is, however the Spanish term, *ackà*, is the Peruvian one.

served, the natural impediments in both parties, make copulation impossible, till aided by the groom.* In case any resistance is met with on the part of the female, the Indians place a slip noose, called by them *pahal*, on her two fore-legs, by which they trip her up, and lighting on her breast, she is placed in that position, in which alone, she can receive the act of generation.

The violent excitement and working of their passions, has been so great, that they are turned out separate to repose, and on this account, the male is never coupled twice on the same day, but in the breeding herds, he generally classes with ten females. When the pregnancy of the female is evident, she is dispensed from toil. Her period of gestation is six months, she never brings forth more than one at a birth, or at least, the exceptions are very rare. They procreate after completing their third year, the age at which they are applied to labour. The female has two teats, which are also visible in the male; but her milk is scanty, and is never used by the Indians

* It is here worthy of remark, that, by the ecclesiastical laws of Peru, no person unmarried, is allowed to be a Llamero, or tender of Llamas, or on the occasions above alluded to, permitted to enter the inclosures. This precaution was rendered necessary, by unnatural propensities that exist among the Indians.

for any purpose, they prefer leaving it to the *Llamitos*, which are not weaned before the age of six months. The Indians call the milk *nūnu*, and the same word signifies teat, as well as to suckle.

The arms of defence, with which nature has provided this animal, consist in the quantity of moist cud he spits out from the mouth, against any object that offends him, and like the cat, in his courtship, he mixes this expression of disdain, with his caresses. Though he spits with strength, to the distance of four yards, and with great plenty, it is fabulous, that the saliva produces irritation on the skin; yet, falling into the eyes, it occasions a smart. This is owing to the acidity, of which it partakes, from the water with which the cud is moistened, having been kept in the stomach so long, as to mix with the gastric juices. Dr. Shaw, is the first author we have met with, who asserts that the Llama attempts to bite; for by that idea he would express, that he intended injury; but this is a peculiarity as foreign in him, as it is to the sheep, unless when playful. We have, however, noticed him to kick with considerable force, and he sometimes stamps the ground, mostly when plagued with flies: He always directs his spittle to the face, or to the hand that molests him.

The Llama, as well as the other three species, ruminates and chews its cud, the same as a cow, but with this peculiar difference, that it appears to chew on one side, and then on the other, distinctly, and we have noticed it to give forty clear grinds, before it swallowed what had been previously bolted, or had reascended from the stomach. Although the Llama, equally abstains from drink with the camel, and indeed much longer, he does not appear to have a fifth stomach, which Buffon attributes to the latter, to serve as a reservoir for his water; but all the four species of Peruvian sheep have the four ventricles common to ruminating animals. Feuillé is the only author we know of, who has described the interior formation of these quadrupeds, by dissection; and in our description of the Huanaco, we will subjoin his particulars. The owner of a Llama, in London, assured us, that though a bucket of water was near the animal, four weeks, he only drank of it once, and that very sparingly; and they frequently pass as many months without receiving into their stomach more moisture than is contained in their green food, yet they void a considerable quantity of urine. From the colder climate they inhabit, they proportionably require less drink than the Camel.

The meat of the kid Llama is good, but has rather the taste of young goat than mutton, yet when old, it is tough, dry, tasteless, and even thought heavy and indigestible, but this is almost immaterial to the Indians, who absorb every other flavour, by the quantity of axi with which they stew it; they prefer it to the wild meat, and consider it of so innocent a nature that broth of it is given to sick persons, instead of chicken. A piece of fresh steak is applied to the eye, to remove an inflammation. The meat of the tame, as well as of the wild kinds, is cured with salt, the acid of sour oranges, smoked first, and then dried in the sun, till it is perfectly jerked. It is cut up into sides, the bones taken perfectly out, and being divided into long adhering strips, it easily admits the salt. In this state, the flesh of the smaller animals, such as Sheep, Llamas, &c. is called *charque* by the Spaniards, and charqui by the Peruvians, distinct from the word *chalona*, which is applied to the meat of the larger cattle, such as oxen, &c. These meats constitute an export article from the upper provinces of Buenos Ayres, that goes to Peru in exchange for commodities, which interior trade is carried on by the way of Arequipa, and Cusco.

The skin of the Llama, when felt through its wool, is to the touch, hard, as pasteboard,

or a coat of mail, and was what the natives originally used for shoes or buskins, but as they did not know the process of tanning, they were obliged, in swamps, or in crossing a river, to take them off, from their not standing water. The Spaniards on arriving, prepared them in a way similar to Morocco skins, but now the superabundance of other hides has rendered them of little use.

The dung of the Llama and Alpaca, which resembles that of the deer, serves for fuel, as does that of the Camel, on the deserts of Arabia, where it supplies the want of wood, and it gives a clear, strong, and lively flame. In Potosi, where fuel is extremely scarce, from all the country round for forty miles, having been bared of wood, for the uses of the furnaces, the inhabitants purchase from the Indians this dung, which they gather in the inclosures, where the cattle is folded, for the night; and this, together with faggots, turf, and charcoal, the Llamas carry, to supply the town, and the mines.

In the whole of the mines, situated on the Cordilleras, from Pasco, as far as Huancavelica, constituting an extent of upward of fifty leagues, the process of fire is partly carried on with this *taquia*, which is the Indian term for animals' excrement. It therefore becomes an article of

sale, and added to turf, besides the furnaces, serves also the culinary purposes, in the mineral regions, where wood is extremely scarce, and where they have not yet learnt the value of coals, which in most instances they possess. Fuel in these inhospitable climes, is not only very essential, but dear; for nature seems to have counterpoised the value of her benefits, by the difficulty of their acquisition. The richest mines are situated in the rugged contexture of mountains, seldom divested of snow, in the most rigid temperatures, in the most desart soils, and surrounded by the dismal prospect of a sterile, and naturally uninhabitable country, and were it not for the resource of the Llama, in bringing them the requisites of life, they would scarcely be tenable.

The Llama bounds, yet in leaping does not spring forward like the three other species, but raising himself on his hind-legs, seems to dart upwards, as if to leap nearly perpendicularly. He rolls on the ground in the same manner as does the Horse, but the Alpaca does not.

We have already observed, that the steady, and we add solemn, slow, majestic gait of the Llama is such, besides being extremely sure-footed, that if the panniers, bags, or faggots, are only well poised, there is no danger of their

falling off; nor do they make use of pack-saddle, bridle, crupper, or girth. Each animal, if they were even a thousand in number, is loose, nor do they appear to interfere with one another, or contend for the road.

The panniers, or what the Indians call *chipas*, consist of two pieces of Llama skins, sowed together, on the top, and hanging down, with the hair inwards, like the flaps of a saddle, to which are woven semicircular pockets or bags of thongs, or basket-work. In these they carry their potatoes loose, in the way represented in our figure; but if it is grain, salt, or any thing small, it is previously put into two sacks, of an equal size; and if fire-wood, it is made up into two equipoised faggots, and merely slung across, as represented by Herrera.

The Llama, although possessed of docility, is nevertheless extremely sensible to ill usage. If overloaded or overworked, he lies down, and is not moved with blows, but returns them with spitting. The Indians by squeezing their genitals, do indeed raise them, but this is better effected by coaxing and patting them, for they are rather capricious, and Herrera has given us the representation of an Indian, kissing and coaxing a fallen Llama, to rise, and proceed on his journey, with his load.

Nature, in every thing, seems to have been extremely provident to this animal. In common with other quadrupeds of the polar regions, she has gifted him with an abundant fat between the skin and flesh, and a copious circulation of blood, which besides distinguishing this species from those, which inhabit the plains, in their natural state, produces in them sufficient heat to resist the extremes of cold; at the same time that the quantity of exterior fat, with which their flesh is enveloped, hinders the dissipation and exhalation of interior heat, to which is added, their thick skin, and soft and warm fleece.

The best breeds of the Llama, are found in the intendancy of Huamanga, in Peru, where the domestic flocks constitute the occupation and maintenance of a considerable number of shepherds, who supply the neighbouring country; but they have no fairs for cattle. The common price of a male working Llama, is three dollars, and this depreciation of the animal, as a beast of burden, is in proportiou to the introduction of the stronger, and more hardy species of European cattle, for Garcilasso quotes them, in his time, to sell for eighteen ducats. An ass in the same quarter, that is, in upper Peru, is worth eight dollars---a mule, twelve---a cow, seven---which is twice their prime cost on the pampas of

Buenos Ayres, and it constitutes a regular trade, to buy them there annually, to supply the interior.

The poorest cottager, is in general, possessed of ten or twelve Llamas, and five or six Alpacas; the first of which, serve to go to the next town, to carry a few superfluous fanegas of Indian corn, sacks of potatoes, or for his children to fetch jars of water on, if the river or spring, be at any distance from his cabin; but especially to carry bags of salt, of which he uses a considerable quantity. The Alpaca is seldom loaded; but his skin, on which he retains the soft fleece, affords bedding, clothing, and wherewith to twist ropes, &c. The Indian, however, even of the present day, seldom tastes animal food, unless, he can catch a Huanaco, or Vicuña, in his snares or pitfall; for he prizes his little congenial herd too much, to become its butcher, unless his wife has been brought to bed, or he has a feast to give to his neighbouring villagers, at the christening, in which case, haunches of kid Llama, stewed cuyes, and chicha compose the treat. The ancient Peruvians also, were extremely sparing in their table in point of meat, owing to their great poverty; with the exception of the Collas tribes, who bred the most cattle; but many of them, during the whole year, only obtained what was distributed

to them by the Inca, at his great hunt, of which mention is hereafter made, and this they salted, and prepared into *charqui*, and stored it for the remainder of the year.

We have been able to discover no trace of the aborigines of the new continent, having used castration, nor is it in any instance, at present, applied to Peruvian sheep. Garcilasso reports, that the Incas, in order to keep account of the great quantity of cattle, meaning Llamas and Alpacas, which they kept; divided and distinguished their herds by their respective colours, for which they had distinct names. The party-coloured ones were called *murumuru*, which the Spaniards afterwards corrupted to moromoro, a word since adopted as a generic denomination of the species, by some European naturalists.* If a young Llama was produced of a different colour to its parents, when sufficiently grown, he was transferred to the flock, that corresponded to his colour, and the herdsman, or *Llama-michec*, kept the returns of the cattle committed to his care, by the knots on his *quipus*,† which were also of the

* Niremb. Hist. Nat. pag. 182, calls the Llama, *aries moromorus*.

† Had prince St. Severus, who wrote a learned, but visionary treatise in Italian, on Quipographia, been in the least a master of the Quechuan language, he would never have asserted, that the *Quipus*, constituted the Peruvian alphabet. He would have

colour of his herd. In the flocks of Alpacas, this superseded the necessity of assorting the wools, when they came to be manufactured.

After what has preceded, and on consulting the many opposite authorities on record, our readers must not be a little astonished, that Dr. Shaw, so late as the year 1801, should tell us, that the Llama is "plentiful in Peru, where it inhabits in a wild state, the highest and coldest parts of mountains, feeding in numerous herds, and flying with great rapidity at the sight of mankind."* But where he got his learned conclusion, that the ancient Peruvians subdued and domesticated them, we know not. Blas Valera, whom we may call the first author who wrote on these animals, calls them the domestic beasts, which God had given to the Indians, congenial to their own soft condition; but he does not say, they obtained them from a wild state, or attribute to them the merit of domesticating them; nor is there a Peruvian or Spanish record, that ever mentioned

been undeceived, had he merely understood that substantive, and the infinitive of the verb *quipuni*, for the one means a knot, and the other to count by knots. The *quipus*, were, and are to the present day, a collection of knots, formed out of the aggregate of a bunch of threads, of different thickness, with more or fewer folds, to indicate units, tens, hundreds, thousands, &c. and their combination and colours, served for every species of computation, even chronology, and to record the annals of history.

* General Zoology, vol. 2, part 2, page 241, ad verb. Glama.

Llamas in their wild state, or a living individual in the country, who has such a trace on his memory. Garcilasso gives two distinct chapters, in the first of which he treats of the tame cattle of the Peruvians, consisting of the Llama and Alpaca; and in the other, he describes the wild quadrupeds, such as the Tiger, Lion, Deer, Huanaco, Vicuña, &c.&c. and in the minute particulars of the Incas' hunt, which we shall notice in its proper place, though he specifies the name of each of the game, he never dreamt of the Llama, or Paco, being included.* Certainly Dr. Shaw must have meant, the Huanaco. Pennant must also have fallen into a similar mistake or confusion, when he says, that the Llamas "inhabit that vast chain of mountains, their whole length, to the straits of Magellan," for it is a fact, that this quadruped has not even penetrated, from Peru, to the Southern parts of Chili, which that author will confess to intervene; nor does Molina, with whom, in other particulars he accords, describe them as being there. Their "feeding on the top of rocks," "with one for a centinel;" "running at the approach of man;" "being hunted with dogs;" "and killed with guns;" which Pennant ascribes to the Llama,

* Com. Real. Lib. 6, cap. 6, pag. 134.

† Pennant's quadrupeds, vol. 1, page 135, ad verb. Camel.

are all particulars relating to the Huanaco. Dr. Shaw has added to his confusions and misconceptions of the Llama, by introducing such a monster, as what he calls the *Cervo-camelus*, which he says is generally quoted for the Glama; but such a shape, tail, head, slouching ears, legs, and hoofs, have no affinity with any quadruped of South America, but the Danta.*

At the arrival and conquest of the Spaniards, they found that the two tame species of Peruvian sheep, constituted the domestic animals, or cattle of the natives; that the Llama was their chief, and almost only beast of burden, the Alpaca being only occasionally used as such, and most prized, for its long, and soft fleece. For a considerable time after the subjugation of Peru, the European traders used the Llama to carry their merchandize, particularly such goods as were consumed by the natives of the interior, but mostly the famous plant, coca,* which were

* See General Zoology, plate 170.

† This is the leaf of a small shrub, long famed amongst the Peruvians, and formerly reserved for the use of the Incas. In botany it is called Erithroxylon of Peru. It now constitutes a great article of sustenance and luxury, to the natives, and by its virtues alone, the miners are enabled to withstand the fatigue and poisonous arsenic vapour, of the mines. It is carried in a pouch, like tobacco, and chewed with an alkali, as the Indians of the east do the betel-nut. Nearly three millions of pounds weight are annually grown in Peru, and thirty millions in Buenos Ayres, estimated at 2,500,000 dollars.

all collected in Cusco, and remitted from thenc to Potosi, a distance of two hundred leagues. This journey round, including the time of sales, and returning, was completed in four months. They had Indians as guides, and to tend the Llamas. They generally went, according to Garcilasso, in caravans of five hundred, or a thousand head of loaded cattle, and about fifty spare ones, in case any should tire on the way.

The merchants accompanied their property, and carried with them small tents, which they pitched at night on some suitable plain; but they never halted in towns, for the want of pasture. After unloading, the Llama, was left to browze or rest at pleasure; and the load was put under cover. Their usual day's joruney was rather more than four leagues, which, as they started at sunrise, they had performed at an early hour in the afternoon, and had sufficient time to pasture whilst it was light, for it is remarked, they do not browze in the dark; but as their gait is slow, and the roads and fields over which they pass, are green, having no bridle to hinder them, they feed as they go along, and a few hours suffice to collect sufficient nourishment, to ruminate during the night.

Another use, to which the Indians applied them, formerly, and occasionally do so to this day,

was to carry *guano*,* from the port of Arica to the interior, for the purpose of manuring their axi, or pepper patches. Since the great multiplication of mules and asses, their application to labour has however much diminished, and where seen, indicates the extremes of poverty. They now constitute the almost exclusive property of the Indians, who indeed are the only people who can manage them; and a Spanish herdsman, or driver, would be perfectly out of character. The Llama also resembles his Indian owner, in many peculiar traits of disposition, and exterior, and the Abbé Raynal has very justly observed, that in this quadruped was represented the true portrait and characteristic resemblance of the Indian mountaineer.†

* Guano is the dung of marine birds, that roost in immense numbers along the coast, but mostly on the small island of Guano, situated at the entrance of the Bay of Arica, now an inconsiderable town under the name of city, on the South Seas, in the intendancy of Arequipa. Vessels bring this manure to the port, where it is sold by the load to the people of the interior, who strew it on their grounds.

† This is however only intended to allude to some peculiar traits and features, remarkable in the Indian, for his general character is complicated. As a conquered and dejected being, he cordially hates and detests the Spaniards; mistrusts him in every act, negociation, or intercourse, even when they appear advantageous. He assists and obeys him, because he is his

THE Llama is affectionate to his keeper; in the morning when he approaches, or after any long absence, he bleats for more than ten minutes, and appears glad to see his friend. This has also been remarked by Mr. CROSS, the owner of the one in Piccadilly.

THE Spaniards have left us no record, that mentions the ancient mode of proceeding on journeys, or driving the Llamas, as used by the Peruvians, but it perhaps differed little from the present, which no author has yet noticed. An old Llama, called the *puntera* or leader, proceeds at the head of the drove, his head ornamented with ribbons, small streamers of coloured cloth, little bells, rings in his ears, as represented in our first plate, and holding on a majestic pace; the rest follow quietly after, and the Indian driver in the rear, whistling as it were in time to the regular cadence of their feet. This is something

superior; an expression of regard seldom escapes his lips; he is scarcely reduced to servitude, but by fear and rigour; he is fond of solitude and retirement; abstemious; superstitious in his exterior worship; reserved, cautious, melancholy; has a peculiar sadness marked on his face, in his voice, and song; a promptitude to deny any thing that is asked of him; a great obliqueness of answer, like the quakers; fond of his children, cruel to his wife; disrespectful to his aged parents; capable of remaining in the same posture, for hours, without moving or speaking, with a variety of other characteristic traits, but yet fond of his Llama, whom he pats and caresses.

like the leader of a string of mules, on the main roads of Spain, where from their knowledge of the track, the bye and cross ways, and peculiar training, the muleteer may sleep, and leave the leader to pick the road, which renders them of double value, to the common ones. An Indian driver is placed to each fifty Llamas, to load or unload them, as well as to take care of the *Chucaras*, the term given to the *Llamas*, that are only first broke in, or that may be restive.

The Indian driver in this plate is also represented in his proper *poncho* dress. This is a long square garment, in shape like a blanket, and slit in the middle, which is put over the head, and carried as the highlanders in Scotland do their plaids. It has no sleeves, nor shape cut in it, and at night serves for covering. It is made of woven stripes of worsted, the main stripe being of black Alpaca wool, but some are also made of cotton and the better kind are elegant and expensive. It is a little out of character to have given him a hat, for the poor Indians are always bare-headed, but this is occasionally worn. The driver is in the attitude of flinging a stone at some distant object, from his sling, called *Wuaraka*, which he always carries with him, and with it he kills a bird, or a rabbit, with great dexterity. He also uses it as a whip, to make a cracking nois,

but does not strike the animal; which, from being peculiarly capricious, will not be urged to quicken its gait by blows, but may be frightened, or coaxed to do it. His sling, or wuaraka, at the same time serves to keep the drove in their track; for, if a Llama takes a wrong path, he flings a stone on the off side, and the animal returns, so that he has not to run after him. In the back grounds of our frontispiece, is a distant view of the ridge, and town of Potosi.

The Aimaraes tribes,* are those to whom the Llama is most congenial, and the greatest numbers and best breeds are found amongst them. He particularly serves to carry their salt,

* The Amaraes tribes, are numerous, and distinct from the Peruvians, or Quechuas, in the centre of whom they live; but notwithstanding the lapse of years, they have opposite customs, manners, language, dress, &c. They seem to be an imported nation, and if their language was examined, it would be found to partake greatly of the Malay. This point is worthy of singular attention, as it would help to throw light on many surmises, respecting the population of the southern Archipelago and Continent; for as there can be no doubt, that the low coast of Peru, was once the bed of the sea, the latter islands perhaps then constituted a continent, reaching to that of Asia, which was inundated, as these waters receded. It may be conjectured, that the Aimaraes, got to Peru, by the port of Arica. This would also clear up the problem of the same idiom being spoken by all these islanders, at distances they never reached by navigation. The Aimaraes now inhabit the central, and upper regions of Peru.

of which they require a great deal for their jerked meats, also their axi, potatoes, maize, quinua, and chuño.* Their droves are not now large, as formerly, and 100 is the greatest number seen travelling on the road together; but Bolivar assures us, that in his time, in Upper Peru, 300,000 of these animals were employed.

We have already observed, that the great cheapness of asses and mules, has now nearly superseded the use of the Llama in the mines, to carry the rough mineral to the bruising mills. They are however yet partially and occasionally applied to this labour, in some; such as Oruro, and Aullagas, which latter is a mine, not far from Potosi, of equal richness, that for many years has been overflown, but is now draining by a German engineer. It is situated in the coldest climate of all upper Peru, and from being covered with snow, most part of the year, is not well adapted to the pasture of any, but the beasts peculiar to the country; whose food is scanty, and picked on the *punas*, or those tracts

* Chuño, is a food, peculiar to the Indians, and much liked by the Spaniards. It is made of potatoes, put into a sack, and left to ferment in a lake of water, for a certain time, and then exposed to the strong action of frost. This, if we may be allowed the expression, is the essence of potatoes, and when dressed with suitable sauces, forms a good dish, and is extremely nourishing.

that stand at the foot of the snows, where the grass is soft, but extremely short. There are besides several other mines, as well as Indian settlements, so bleak and elevated, that European cattle can scarcely live, where without the Llama, many operations of the road could not be carried on; his occupation, however, as the Abbé La Pluche observes of the ass, has a tinge of the meanness of those who employ him, for the most abject offices, are now, his ordinary lot.

As we conceive, that a wrong impression has been left on the minds of Europeans, by even late authors telling us, that the Llamas served formerly, in the time of the ancient Peruvians, and still, serve to carry the rich ores from the mines of Potosi, over the narrow paths of the Andes, we will endeavour to explain and correct this assertion. Though, the ancient Peruvians, knew the use of gold and silver, as ornaments for their temples, and as the appendages of rank and distinction; yet we have no fragment that mentions their employment of the Llama, in the carriage of rough ores. This usage, we imagine, was derived from the Spaniards, for the Indians having no bruising mills, of consequence had not to choose the locality of a stream; and this, not being at all times found near the vein, the Llama was applied by the

former, for this conveyance, as the only beast of burden yet in the country. The aborigines, for want of tools, had not gone far in the art of mining; horizontal veins were the only ones they attempted, and the mines of Porco, which had been previously worked by them, at the time they fell into the hands of the three brothers, Pizarros, had only been excavated at the entrance; but the mineral to be fused, was bruised with a mallet, and underwent the operations of the furnace, on the spot where it was gathered. Nor did their gold require the conveyance of a beast of burden, for being collected in the *lavaderos* * of the rivers, it was too partial, and too precious, to be carried by any other than the Indians; and in fact, all the great works of the Incas, were effected by the number of hands, they could at any time turn out.

The great mines of Potosi, owe their discovery to the accidental escape of a Llama-chucara, that had fled from its drove, with a load of maize; and being pursued up the ridge, by an Indian driver, he was benighted on the summit, and to break the intense cold of the atmosphere, was under the necessity of lighting

* Lavadero means a washing place, and the natives yet collect gold in the beds of the rivers, and washing the sand in small calabashes, the heavy particles precipitate to the bottom.

a fire, when to his great astonishment, in the morning, he found the stones, that had confined his fuel, were filled with abundant particles of melted silver. When first worked, the nearest mill stream was two leagues and a half distant, and thither the Llamas were accustomed to carry the rough ore; but in the year 1576, the lakes that stand above the town, were enlarged, and made to supply water to a mill stream, and on it one hundred and thirty-two mills were erected. Owing to this convenience, and the great multiplication of European cattle, the Llamas were no longer used in that quarter, excepting to bring supplies as before noticed, but in those regions, where they are yet retained, in the mines, the males only are used.

Some of our European authors have nevertheless told us, that they carried their loads of ore, across the Andes mountains,* which must mean a journey of some distance, yet they did not reflect, that the rough mineral of Potosi, or the Paco ore, only yields about twelve ounces per caxon, or per each fifty hundred weight, so that we may hence imagine, what could be the value of a Llama's load, that only carried one hundred pounds.

* Potosi, though not situated on the range of the Cordilleras of the coast, stands, nevertheless, on one of their ramifications.

The natural food of the Peruvian sheep, is, as we have before noticed, a plant called *ychu*, a species of fine pointed rush, extremely small, and abundant on the *punas*. Round Potosi, they also eat a soft, short moss, and generally all kinds of grass and grains, such as maize and quinua, which latter is a grain, peculiar to Peru, resembling millet. The Llamas in England have been noticed to prefer green rye and carrots to all other foods. They also eat hay and straw; and it is curious to see the Llama pick up a straw by the middle, or the wrong end; he gradually passes it through his mouth, till he comes to the ear, which he clips off, and lets the remainder fall.

The usual age, to which the Llama lives, and is serviceable, is twelve years; he begins to work at the age of three, but if in the mines, he never lasts more than four seasons; for owing to the arsenical and sulphurous particles, that there abound, an eruption or scab, breaks out, which, if malignant, it is almost impossible to cure. This disorder seems peculiar and common to all the four species of Peruvian sheep, and Garcilasso de la Vega gives the particulars of a pest of this nature, called by the Indians *carache*, which literally means the itch. This occurred under the administration of Blasco

Nuñez Vela, third viceroy of Peru, in the year 1544, making its appearance under the belly and joints, in those parts most divested of hair, and spreading contagiously, it carried off two thirds of the country cattle, from which time, they have never been so abundant as before. It even reached the two wild kinds, but in them was not so destructive, from their inhabiting a colder region, and not going so much in herds, as the tame ones.

NOTWITHSTANDING the Llama cannot boast merits, as a beast of burden, he possesses many beautiful and interesting traits of exterior, and would be a valuable acquisition to a gentleman's park. His lofty, ostentatious gait, his bounding and antic tricks, his elegance, and proportion of parts, the solemn and majestic cadence of his feet, when walking, would be a pleasing sight on the lawn; and from the improvements we have noted in the fleeces of those imported, we risk the conjecture, that his coat might be, in a few generations, divested of the hair, which is its only objection; and we think, amidst the improvements of the age, that our artists are capable of an invention in mechanism, to separate the hair from the wool, and in the mean time, this occupation would give employment, to poor individuals. We may at least say of the Llama,

what Buffon has said of the stag, that it is destined to embellish the forest, and animate the solitudes of nature.

We may be accused, of having descended to too minute particulars, respecting the copulation of the Llama, but we have been induced to do it, from a want of this information, having rendered attempts in England to procreate them, unsuccessful; whence has followed, the false deduction, that they cannot breed out of their own climate. The most successful and conclusive experiments have been made in Buenos Ayres, which is a temperature less congenial than ours, and the specimens hitherto brought to England, have been extremely healthy, and have taken well to their food. Our two figures of the Llama, are copies from life, and in the landscape of the second, we have given a distant view of the *Huacas** of the Indians, and in front

* *Huacas*, were places of interment for Indian chiefs, as the pyramids were in Egypt. They appear as a large mound, resembling in shape a sugar loaf, and at a small distance, present the view of hills. The concave part constituted a hollow tomb, the roof supported with wooden joists, and in this the bodies of the great men, were laid in state, with all their riches, and many figures of gold, silver, and clay. Earthern pitchers filled with chicha, or beer, were laid beside them, called huaqueras. The three figures in the plate, represent originals, found interred. The Huacas were generally situated on plains, and

the *Huaqueras*, or earthern pitchers, found in them.

their height and size gave an idea of the magnificence of the person therein inclosed. In Truxillo, Caxamarca, Huamachuco, and Pataz, they are yet seen fifty, and sixty feet high, with a suitable base, and greatly resemble the large circular mounds, said to have been left by the Romans, that stand between London and Bristol; and to their construction the Llamas assisted, in the carriage of earth.

THE ALPACA.

THE Alpaca, and Paco of the Spaniards; the *Alpacka*,* *Pacocha* and *Paco-Llama* of the Peruvians; the *Chilihueque*, or Chili sheep, of the Chileños; the *Camelus-Paco*, *tophis nullis*, *corpore lanato*, *rostro oblongo*, of Linnæus; is the other remaining domestic animal of the ancient Peruvians, but partakes so much of the properties of the Llama, that a more concise description than the preceding, will suffice.

In stature, the Alpaca is something less than the Llama; its ordinary height is 4 feet, and the length of the body rather more. The height of the Alpaca, belonging to Mr. Cross, and exhibited in Piccadilly, is 3 feet 8 inches, to the top of the back, and the length of the body, from the chest to the rump, 4 feet 1 inch. The neck is not quite so long, so slender, or so much arched, and though its general appearance is not so noble as the Llama, it is nevertheless more interesting.

* They give the *ck* a strong guttural sound.

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The bodily construction of the Alpaca, when divested of his fleece, resembles that of the Llama; has the same small, tapering waist. The proportions of the one above alluded to, were 4 feet 10 inches round the girth, by the fore legs; 4 feet 6 inches in the middle; and 3 feet 4 inches, round the waist; but considerable allowance must be made for the great quantity of wool and hair, on the back of the animal, at the time it was measured.

The Alpaca has the cleft, or harelip, the same as the Llama; and when eating, from a contraction of the muscles, at that moment he shews the teeth, which are on the same plan as those of the Llama, or such as distinguish ruminating animals; but the upper gums, which also occasionally appear, are of a black, jet colour.

The head approaches rather nearer that of the Sheep; and notwithstanding Dr. Shaw, and others, tell us, that the ears are flaccid or pendulous, (for this he attributes to the Chilihueque, which is the Alpaca under another, or provincial name) they are in fact much more erect than those of the Llama, and seldom take any other posture. Even when vexed, or in the act of resentment, he does not couch them, as the latter. The snout is not so long, or so black, as that of the Llama, is less pointed, the nostrils are not so dilated,

nor situated so high. Frezier asserts that the face has some reference to the human one, but he must here have only alluded to its expression.

The Alpaca is less retromingent than the Llama, and the genital parts of both sexes being better formed, they do not require the aid of man. The period of gestation, in the female, is the same as in the Llama; she has one kid, and the construction of the udder is the same. Her milk is entirely left for the young.

The Alpaca has the peculiarity of the hind-legs being smaller than the fore ones, and more curved; the foot is cleft like the Llama, with hooked spurs, but smaller, and even more delicately made. The Alpaca cannot bear his feet to be touched, never bites them in play, as does the Llama, but the two corns, on each pastern joint of the hind leg, are the same.

Notwithstanding Linnæus has used the distinction of *tophis nullis*, which we understand in opposition to the *topho pectorali*, attributed by him to the Llama, the callosity on the sternum of Alpaca is the same, but proportionably smaller yet he rests on it, in the same way; the noise of the body lighting thereon, is equally heard, and it serves as a support as well as a defence. The position of resting are alike, with those of the Llama. The tail is much more bushy, and

planted with more hair, but it does not serve to chase away the flies. The female is particularly careful to lift it up, when voiding urine, but in all other cases, except when running, or in active motion, it is perfectly pendant, and close.

From its peculiarly long, lank, and flaxy fleece, the Alpaca constitutes the greatest variety of the whole four species of Peruvian sheep; and when this is at its full length, from being so extremely abundant, he appears twice as corpulent as the others. It hangs in large flakes down the sides, rump, and breast, generally 8, 10, and 12 inches long, and we have measured it on the flanks even 16; so that the proportion with the others, in point of fleece, is almost pounds for ounces. The Alpaca partakes of more colours, is often party-coloured, and is seen more frequently white than the three other species. Hair as fine and soft as that of the human head, outtops the wool that is underneath, amongst which it grows; so that their fleece is a combination of wool and hair. The Indians prefer the black Alpaca, from that being the colour they use for their clothing, and there are many tribes, such as the Canes, in the intendancy of Cusco, who use no other colour, and this gives them the appearance of always being in mourning. They are also seen brown, cinnamon colour, and every

other observable in the Llama, but, black being the most favourite, in the seroons of Alpaca wool, that are exported, the proportion of that colour, exceeds by nearly nine tenths, the other shades.

The Alpaca ruminates, in exactly the same way as the Llama, and it is remarkable, that both generally gape twice, or three times, before they commence this process; but he is the only one of the four species, that does not express his resentment, by spitting his moist cud. This is an indication that his manners are more soft, and his disposition more gentle; he has no antic tricks, nor does he bound, and leap on his keeper, like the Llama.

Notwithstanding Buffon's assertion, that the forms of the South American animals, "are imperfect, and appear to have failed, or been neglected," we think that no quadruped in nature, is possessed of a finer figure, and more striking appearance than the Llama, freed from restraint, and bounding in his pasture grounds; nor do so much soft expression, and such innocent looks, sit on the face of any beast, as on the Alpaca. He returns, and appears sensible of the caresses of his keeper, and becomes unhappy at his absence. In the East, the greatest compliment that can be paid to a female,

is to tell her, that she has eyes like the Antelope; yet the Peruvian sheep generally, but most the Alpaca, rival him in so beautiful a trait; for they have them large, black, expressive, and sparkling. This is a trait that appears influenced by climate; it is general in South America, and is the characteristic of a soft, and delicate constitution, according to our inimitable Darwin. Tasso tells us,

La terra molle, è lieta, e dilettosa,
Simili à se, gli abitator produce.*

This feature is not then confined to man, but extends to the choicest of the brute creation; which though it cannot boast size, compared with the rangers of the wilds of the old continent; yet delicacy of shape, fine proportions, and animated and beaming features, are more than equivalents.

The female Alpaca belonging to Mr. Cross, and exhibited in Piccadilly, besides being the first specimen brought to England, would be considered a beautiful one, even in Peru. She was chosen, in the interior regions of that country, as well from her gentleness, her tractable and placid disposition, as for her waving fleece of distinct white and dark brown, added to delicacy

* Tasso Jerusalem, c. 1, oct. 62.

of figure, and graceful aspect; to be sent to the city of Lima as a pet; nor is there a person, who has seen her in England, that has not paid the highest encomiums on her soft expressive looks, her neatness and gaiety; and many in terms of absolute rapture. In our third plate, we have given an exact delineation, but even the canvas would not do adequate justice.

We cannot here, refrain from mentioning, a peculiar trait of instinct and memory, which we witnessed, in the astonishment produced in this animal, by her tender putting on a real Peruvian Poncho. From the manner in which she was roused, her uncommon animation, her smelling at the garment, and steadfast looks; it was evident that some faint recollection of her former Indian keeper remained; and that her native regions were not altogether forgotten. This would almost appear imaginary, had it not been witnessed by several bye-standers; nor is it possible to describe the electric surprise, which this little incident created in the animal.

The skin of the Alpaca, even felt through the soft down, that covers its neck, is extremely hard to the touch, can scarcely be impressed; but this, as we have before observed, is the provident gift of nature, as a guard to the climate. The Alpaca is not noticed to eat its wool like

the Llama, nor does he roll in the same way. He is not near so voracious of his food, nor does he expresses such resentment, if disturbed when feeding. The same abstinence, with regard to drink, is remarkable in him, and although deprived of water for a month, he nevertheless voids a considerable quantity of urine, which in England has been observed to be increased, by green vetches being given him. He is not noticed to feed whilst resting on his breast, which is the case with the Llama; and in almost every action he is more nice and delicate. He is not however possessed of such quick movements, or gaiety, nor does he bound with that vigour and agility, remarkable in the Llama and Huanaco.

NOTHING can be more incorrect, than the assertion of a variety of authors, that these animals neigh like a horse. They rather bleat like a sheep, but with more shrillness, and mix with this noise a degree of snorting, which however is the loudest in the Huanaco.

DR. SHAW has been extremely sparing in his description of this animal, though so beautiful and so interesting; but he is mistaken when he adds, that it is only sometimes called the Peruvian sheep. From its being one of the tame cattle of the Aborigines, it received that dis-

tinctive name at the conquest by the Spaniards; but neither they nor the Indians extend that denomination, either to the Vicuña, or to the Huanaco; though for obvious reasons, they equally deserve it.

Notwithstanding that European writers, and even Molina, assert, that the Paco is found in great numbers, in a wild state, on the mountains of Peru, yet this is a most glaring mistake, nor is there a native of that country, who ever heard of such a thing. Had this been the case, even formerly, they would have been hunted for their fleece, which was the most prized, as well as for their flesh; yet neither Garcilasso, nor any of the ancient Spanish authors, in the most distant manner, allude to such a circumstance, though they particularly specify, the Huanaco and Vicuña. If they inhabited the wilds in the present day, they would be more hunted than even the Vicuña, and of consequence would have been included in the prohibitions of the royal decrees, not to kill, but to endeavour to domesticate them; yet we have purposely examined the edicts tending to this subject, without finding a trace of their name, and a Peruvian has laughed at us, when for greater satisfaction, we proposed the question. Molina was not acquainted with Peru, but he knew Chili too well,

to tell us, that the Chilihueque was wild in that country; yet as we have before noticed, notwithstanding the separate articles and descriptions in Zoology of our own authors, this is only a provincial name for the same animal. In trade, Huanaco and Vicuña skins in hair, are common, in the state the hunter obtained them; but the wool of the Alpaca is shorn, packed in seroons, and only seen out of the country, on the skin, as a rarity, nor used in that way but as bedding by the Indians. Frezier, in his voyage to the South Seas, says, that the people of Chili, call the Llama, the Chilihueque; but this is a confusion as great, as making it into a fifth race; yet this originates from this animal being formerly applied to the same purposes as the Llama; but as the introduction of mules had superseded their use, our anthor, when he touched on that coast, could not have seen them, from their being reserved for the interior; and when told, that the Chilihueque was a country beast of burden, it might easily be concluded, it was the Llama.

Though both of the domestic kinds of Peruvian cattle, equally indure thirst with the Camel, they cannot be said to be habituated to the same abstinence with regard to food; for in a country where verdure is abundant, they are

not exposed to the pangs of hunger. The Alpaca is however more delicate in its food, than the Llama. The value of an Alpaca, in upper Peru, is about one fourth less than a Llama, which depreciation is owing to the great overstock of wools.

The Peruvians must have derived the name of Paco, from a distinctive allusion to colour; for, in the Quechua language, it means reddish brown, and *paco milma*, signifies wool of a russet colour. Their chiefs were cloathed in stuffs, made of the picked wools of the Alpaca, both dyed, and in their natural colour, which possessed a gloss and fineness, that equalled silk. They also esteemed him for his beautiful exterior, and he constitutes some of the finest allegories and most pleasing similes of the Peruvian language, that frequently occur in the stanzas of their Yaravies.*

The Arabs, according to several authors, even to the present day, consider the Camel and the Dromedary, as presents from heaven; as sacred animals, without which they could neither subsist, trade, or travel; and in a similar light, did the aborigines of Peru view their Llama and Alpaca. According to Garcilasso,† the Collas tribes, pre-

* A soft and melancholy love song, peculiar to the Peruvians.

† Com, Real. Lib. 2. cap. 18. pag. 45.

vious to their conquest, by Lloque Yopanque, third Inca of Peru, who reigned about the year 1171, of the christian æra, adored the white Alpaca, as their principal and presiding divinity; to him they offered sacrifice, and considered him, as descending to them from the upper world, or *Hanan pacha*, the term they applied to heaven. Under the form of this white quadruped, they believed, that their divinity had come amongst them, and that from a mark of special favor and preference, this species procreated more abundantly in their territories, than in other quarters. They however esteemed the white breed the most, from imagining, that the nearer they approached their original progenitors in exterior, the more they possessed his attributes, and were of consequence, the more celestial. The Araucanos* yet offer up their Chilihueque in solemn sacrifice, and many of the tribes have them as blazons. They were also in the cere-

* The district of Arauco, is a small province, belonging to Chili, twenty leagues long, and seven wide, and its inhabitants were the hardiest, and most warlike the Spaniards had to conquer, in the whole extent of South America. Their bloody wars, their traits of independence and conquest, formed the subject of the celebrated epic poem of Don Alonzo de Ercilla, mentioned by Voltaire; and by Cervantes, in his *Historia de Don Quixote*, vol. 1, cap. 6, called the best heroic poem written in the Castillian language, and one of the richest poetical treasures Spain can boast.

monies of religion, and treaties of peace, immolated as a token of friendship.

Buffon has observed of the Camel, "that it is the only beast of burden, whom man has not harnessed, or taught to draw," but we are strongly of opinion, that this is equally true, with regard to those of Peru. Dr. Shaw has indeed told us, on the authority of writers who preceded him, that the ancient inhabitants of Chili, used the Chilihueque for ploughing; yet, though Molina mentions, that this instrument of tillage, is, in the present day, used in those countries; he does not altogether establish, that it was the custom of their ancestors to employ it, previous to the conquest. The Peruvians, who had confessedly carried agriculture to a greater pitch than any of their neighbours, were not in the least acquainted with this implement, nor does the Quechua * language admit of a term, that is equivalent to plough. They have indeed the verb *tarpuna*, which means to sow, or to

* The Quechua language, was originally, the one spoken at the Inca's court, and gradually extended to the whole empire, and even amongst the conquered nations. It became at last, the general speech; the canticles of worship, were entoned in it, the decrees and laws, were published in it; it served to hand down the historical traditions, from father to son, and formed the study of all the polished classes. It is at present, spoken with most purity, in Cusco, and the surrounding provinces.

plant; the process used for their Indian corn and potatoes, in grounds prepared by wooden spades; and Garcilasso pointedly says, that they did not till the ground, or plough it, because it did not require it.*

We conceive that the supposition of their being acquainted with the plough, originates from their use of manure; but this was put into the ground, by a hole being previously made with a wooden stake, or spade, in which a proportion of *guano*, or *sardinas*, was thrown, and on this layer, their Indian corn, or potatoes were cast; and if it was in their pepper patches, the dung was scattered at the roots of each plant. Molina indeed expresses a doubt of the plough now used by the Chileños, being introduced amongst them by the Spaniards, from its great simplicity, "from its being nothing more than the limb of a tree, curved at one end, in which is inserted, a share, made of the same material, with a handle to guide it." Had he however reflected, that in many parts of Spain, up to the present day, they use little else, only that the share is of iron, and that the plough with which they there scratch their lands, would exactly answer the one described in Virgil's Georgics, which is retained with little or no improvements;

* Lib. 5, par. 1. Com. Real. pag. 102.

he would scarcely have been led, to make such a deduction. The iron wood, and others, are nearly equivalent to metal, and this in Chili has at different periods been at one hundred dollars per quintal, so we ought not to be astonished, that the Indians of both Peru and Chili still use wooden ploughs for their wheat, though the Spanish farmers have shares made of iron.

Admiral Spilberg, who sailed from Holland, in the year 1614, to the South Seas, on a voyage of discovery, mentions, that the natives of the island of Mocha,* applied the Chilihueque to the plough, in the preparation of lands, but this was long after the introduction of wheat, and the multiplication of cattle in this quarter, was co-temporary to the adoption of that grain; but we can hardly imagine, what effect two Alpacas, or Chilihueques, could have on grounds, that now require four oxen to turn them over, though the plough is exactly the same. We are strongly inclined to think, that there is some fault in the translation, and that the idea of their being yoked to a kind of truck, was intended to be

* A small, fertile, and pleasant island in the Araucanian sea, near the coast of Chili, about sixty miles in circumference. In the last century it was inhabited by Spaniards, but is at present deserted. *Molina.* It stands in about thirty-eight degrees of South latitude.

conveyed: it is not the first time our English translators have mistaken *charrue* for *charrette*.

We have been at some pains to trace out the authority of the old Spanish authors on Chili, respecting this subject, but in vain; yet we have been able to discover, that neither there, nor in Peru, is there left an impression, that their ancestors used a plough, previous to the conquest, and of consequence did not apply the Llama, or Alpaca to its draught. With the first, the Chileños were not acquainted; and unless the second has much degenerated, we conceive it unsuitable for such an operation. As we have before noticed, the Alpaca is now only occasionally used, as a beast of burden, to carry 75 pounds; and Garcilasso expressly says, that it was not formerly used as a beast of burden, but only esteemed for its flesh and wool.* The fact is, that at present the Indians never employ the Alpaca in a journey, or in more than an occasional day's work at a time; nor from its physical and moral constitution, is it capable of the fatigue to which the Llamas are habituated; but when they do load him, so great is his spirit of docility, that he follows the little group, patient and submissive.

* Lib. 8. cap. 16. Com. Real. pag. 215.

We consider it no less an egrégious error in Molina, and those who copied him, to assert, that the Llama and Alpaca possess, in common with the Camel, the property of kneeling, to receive and discharge their loads, a training by no means necessary, or taught them. This was indeed serviceable in the Arabian drudge, from his height, from his burden being seven or nine hundred pounds; but what are seventy-five or one hundred pounds to the Indian Llamero of the mountains, who, when the roads are bad, eases the animal of his load, and carries it for him.

Bougainville, has, with the greatest justice, observed, that in no part of the world can such models of a Hercules, or a Mars, be found, as in Otaheite; and, he might have equally added, on the Andes mountains. Notwithstanding that the Peruvian Incas, by their decrees, reserved their subjects, and employed them in public works, and in the construction of palaces and forts, they were, in fact, as much applied to the drudgery of carrying, as their sheep; and the heaps of stones yet found on the roads of the *Sierras*, and called *Apachectas* by the Cusquenians, are eternal monuments of this fact. When the Indian had overcome an elevation, or rugged path, with a heavy load on his back, he rested, and made an offering of the first thing he met

with, which was generally a stone, to their god Pachacamac, repeating the word "*apachecta*," which means, to him who creates or gives strength to carry my burden*; and thus were these heaps gradually collected, and in time the Holacaust became a divinity. With superfluous hands of this nature, and without suitable grains, it can scarcely be imagined they used ploughs.

Of all the singular denominations given to the animal under consideration, perhaps that of the "Arcana of Nature," No. 4, (April, 1810) is the most unaccountable. It is there called the *Acalpa;* and we are besides informed, "that it is nearly extinct, incapable of domestication, and has been now entirely hunted down by the Spaniards." The *learned* author of this article must certainly have been little acquainted with the Spanish creole, to suppose him capable of such an exertion, or that he has penetrated into those parts of the interior, where scarcely the Indian has hitherto ventured to tread. Yet nothing can so strongly argue the *profound* knowledge displayed in the same essay, as the deduction there drawn, that it is "the increasing population of the solitary districts that has caused the annihilation of several curious animals, which existed when the Spaniards invaded America."

* Dr. Unanue, Treatise on Coca.

This argues a most *accurate* comprehension of the past, and present census of the country. We wonder what ratio this newly discovered increase bears, with the population in the time of the Incas! We have indeed heard of the Spaniards being oppressive to their subjugated Indians; not that we by any means think this the cause of their avowed decrease, but we do not know how it could affect the extinction of animals, that inhabit countries which they scarcely know but by name, or by what the Indians have told them. All these clashing and contradictory accounts, originate in the confusions of the four species of Peruvian sheep; from mistaking the Paco for the Vicuña, the Llama for the Huanaco, and from our not knowing, that although they all belong to the same genus, they are perfectly distinct in their form, properties, and race, besides two being domestic animals, and the other two wild ones.

Since the great multiplication of Spanish sheep, the Alpacas have decreased in estimation, the same as the Llama, since the introduction of mules and asses. They are however bred in herds, by particular tribes in upper Peru, but mostly in those regions that belong to the Vice-royalty of Buenos Ayres. In consequence of the tracts of country, on which they pasture,

being covered with a great quantity of furze and thorns, a large portion of their wool is lost; and this, together with their not being carefully folded for the night, makes the Spanish American wool so extremely dirty. The herdsman who attends the Alpacas, has his sling, and uses it in the same way as the Llamero: it is a characteristic in him, as the crook is in our own shepherds. His wages are two rials (1s. 2½d.) per head per annum, for tending large cattle, such as cows, oxen, mares, and mules; and twenty rials (11s. 3d.) per hundred head, per annum, for smaller ones, such as Sheep, Alpacas, Llamas, &c.; besides which, he has some perquisites, in the fleeces, kids, and skins. Spanish Sheep and Alpacas are regularly shorn twice a year, in June and at Christmas, at which time they are always brought into the warmer climate of the lowlands; indeed the shepherd has great regard to the most seasonable food, as well as temperature, and this he can at all times vary, by ascending or descending for a day. The Alpaca wool, when shorn, bears an equal value with that of the common sheep, but is much cleaner, and sells for 7 or 8 rials per arroba (25 lbs.) or 4 cents per pound. The price of a sheep is a dollar, but by being killed, salted, the skin cured, and the whole carried to a neighbouring market,

it may fetch three. Two sheep are generally estimated to be the value of one Alpaca.

The Alpaca, introduced into England, would be a still more beautiful ornament to the lawn than the Llama, and might be rendered a more domestic pet. Its wool would also be of more manufacturing value; the soft and fine parts obtained from the neck, might be worked into hats and shawls of great estimation, and its general fleece applied to the purposes we shall point out, in our concluding dissertation on South American wools.

Huanaco

T.W. GEMAN DEL.T et SC.T

THE HUANACO.

THE *Huanaco*, or *Guanaco* of the Spaniards, the *wuanakù* of the Indians of Peru,* the *Luan* of the Chileños, the *Camelus Huanacus*, *corpore piloso*, *dorso gibbo*, *cauda erecta*, of Linnæus, is the largest of the two species of wild Peruvian sheep, yet generally rather smaller than the Alpaca, of course less than the Llama. Its stature, on an average, is from $3\frac{1}{2}$ to 4 feet high, sometimes $4\frac{1}{2}$ to the top of the back, and like the Alpaca, the body is somewhat longer, when measured, from the breast to the rump, but rather more corpulent.

WE have before noticed, that this animal is found only in its wild state, and has not been domesticated, but in some solitary instances. This would be a task by no means difficult, when taken a suckling, but if full grown, it has been proved impossible. It would not therefore, be easy to understand Dr. Shaw's assertion, that this animal is found in similar situations with the

* The Quechua language, having no *h* or *g* initial, with a guttural sound, the Peruvians write and pronounce the word, with an aspirated *w*, and lay great stress on the *u* fina

Llama and the Paco,* when the two latter, are tame and domestic animals; whereas the one under consideration, excepting in very solitary cases, never was reduced to that state. What Molina, and the above author could have meant, by insinuating, that it sometimes grew to the size of a horse, we are at a loss to judge, but certainly the comparison must have reference to that of a lean Welsh poney. Both Horse hides, and Guanaco skins, are to this day, articles of general export from most parts of South America, particularly Buenos Ayres; we have had repeated opportunities of seeing them abroad, both loose and in bales, and have uniformly found, that the proportion was nearly, that of a calf skin to a cow hide, and if this be doubted, there are plenty in London, arrived in cargo, to prove the fact. The Guanaco is indeed the largest of the two wild kinds, but not as Dr. Shaw has told us, the largest of all the Peruvian animals of this species.

The largest Guanaco, supposed to have been caught in Peru, was one that came down to the city of Buenos Ayres, in the year, 1805, in the number of Peruvian sheep, destined for the ex-empress Josephine, of which mention will be hereafter made, and it stood about as high as

* General Zoology, ad verb. Guanaco. vol. 2, page 246.

the Llamas that accompanied it, but was much more fierce. There was one peculiarity attached to this specimen, which was, that it was white, the first entirely of that colour, seen in the capital of La Plata, and we might add, the first taken, alive.

The two wild species of Peruvian sheep do not partake of the same diversity of colour, as the tame ones; and Garcilasso * pointedly says, that the Huanacù has only one colour, which is a russet brown, or reddish colour, and in fact, in a whole boat-load of skins, such as they descend the Paranà, no other is to be found. It was not till within these few years, that the wild kinds have been discovered, white, as we shall hereafter notice, and the great merit of the Guanaco above alluded to, and destined for the menagerie of Paris, was, that this was its colour. Some white skins had been previously obtained, by the hunters, but this was the first taken alive, and a great premium was given for it. From being full grown, however, he was extremely ungovernable, but was visited, not only by several South American natives, now in England, but by English merchants and officers, who were in the country, at the time of his capture.

* Com. Real. lib. 8, cap. 16, page 213.

From the lofty and majestic gait of the Guanaco, its greater activity, when compared with the broken-spirited Llama, who in point of contrast, bears about him the marks of slavery and subjection, though specifically less, he appears to equal the latter in size, and when a wild herd is descried, by the hunter, at a distance, it is by this criterion alone that he judges, whether it is composed of Guanacos, or Vicuñas.

In general exterior form, the Guanaco most resembles the Llama, and Garcilasso expressly says,* that he is of exactly the same size, form and wool, and hence the Peruvian distinction of Huanakù-Llama originated, as is confirmed by Feuillée.† The most sensible difference to the eye, is the gibbous, or rather arched back, coarse shape, coat more shaggy, smaller feet, the face resembling more that of the Vicuña, rounder, the snout not so long, no callosity on the sternum, opposite disposition and properties, which, though they constitute the Guanaco a different race from the Llama, nevertheless its general appearance and construction belong to the same genus. At a distance, the

* Com. Real. lib. 8, cap. 17, page 217.

† Les guanacos sont des animaux presque semblables aux Llamas, &c. vol. 2, page xxi, and this is the man who performed the dissection of one.

Huanaco most resembles the doe, or female fallow deer.

The *cauda erecta* of Linnæus, and Dr. Shaw's remark that the tail is short and turning upwards, are however incorrect, for the tail in every thing resembles that of the Llama, only like the general fleece, it is more shaggy, from its wild state, and greater exposure.

The curve in the body, and tapering waist, are much less in the Guanaco, for which reason, the difficulty of copulation is not so great. The ears resemble those of the Llama, and of consequence are not so characteristically erect as the Alpaca's, for the act of couching them is in many cases observable. The callosity on the sternum is not noticed in either of the wild kinds, but the positions of resting upon the breast are used. The skin is however thicker on that part, and there is a greater concentration of hair. The head is rounder, the nostrils not so dilated, and the muzzle is covered with red, instead of mouse coloured wool. The cleft lip, and teeth, exactly resemble those of the Llama, and he ruminates in the same manner, but has the trick of spitting much more; indeed if annoyed, or much vexed, he would cover the object of his resentment with a deluge of his moist cud.

We have already noticed, that a remarkable difference in the Huanaco is, that the feet are smaller than those of the Llama, they are cleft in the same way, with hooked spurs in front, but not so rounded or so large in the sole. This gives him the appearance of being cleaner limbed, and corresponds with his greater degree of swiftness. One would almost conclude, however, from our English descriptions, that the construction of the Huanaco's legs, resembled that of the Kangaroo. Whoever examines the formation of the Greyhound, will indeed find, that the hind legs are considerably longer than the fore ones, but the animal nevertheless stands level. This is owing to the sockets of the fore legs being near the breast, whereas those of the hind ones appear to be lodged near the back. The bodily construction of no animal amongst us, approaches that of the whole four species of Peruvian sheep, so much as the Greyhound, and the Huanaco is by no means an exception. Indeed the whole four species, like the animal just alluded to, appear to have the legs too long for the proportion and size of their bodies.

This mistaken peculiarity of short fore legs, attributed to the Huanaco, has given rise to a very singular, and we think, unwarrantable deduction, viz. that it is supposed he prefers descending the

hills, which Dr. Shaw says he does by leaps and bounds. Were his fore legs in reality, proportionably shorter, his greatest advantage would be in ascending a hill, as that would bring him more on a level; but the fact is, that his natural propensity, when chased, to quit the hills, which are, we may say, at all times uncovered, originates from another cause.

In Chili, it is usual to hunt the Huanacos, with the lazo or noose, and when chased, they betake themselves to the plains, as well from these being the best theatre for their fleetness, as from their finding there cover in the thickets, where the noose cannot be thrown, and as they have no horns, they are not in dread of being entangled in the bushes.

This is attributing perhaps a greater degree of instinct to this quadruped, than European zoologists would be willing to allow, but he is in fact crafty, and, like the roe, uses every address, to withdraw himself from the pursuit of his hunters. This is however less observable in the Vicuña, partly from its greater timidity; it is an easier prey to alarm, and reasons less on what may promote its security. In the old and full grown Guanacos, there is a spirit of courage and independence, that urges him, if hemmed in by his pursuer, to turn round, and struggle

for his liberty. This courageous and independent spirit was particularly remarkable in the white Guanaco, brought down to Buenos Ayres, and before noticed. It was necessary to keep him chained in a distinct wooden inclosure, and from the attacks he made on his keepers, parents would not suffer their children to approach him, notwithstanding they caressed the Llama and Alpaca.

The Huanaco's fleeing from the hills, is also accounted for by the Indians, mentioned in the way above, who have certainly observed them with the most accuracy; but this is not remarked in a herd of Vicuñas, from the reason we have before given; but should any accidentally be found in the herd of Huanacos, they follow, and adopt the same means, to evade the hunters. These resources of instinct, are equally noticed in the Llama. When in leaping or bounding, he happens to get his feet entangled in his chain, in the lattice of an inclosure, or an impalement, he immediately uses an opposite effort, by which he liberates himself, without assistance.

The Huanaco is decidedly the swiftest animal the Peruvians have; and that it was considered as such, in ancient times, is proved, by the anecdote of one of the Incas, meeting with a

messenger, whose swiftness in travelling had been so great, that he complimented him by the expression of *tia huanaco*, "sit down huanaco;" the name which this town, situated near La Paz, and where the anecdote occurred, has since retained.

The Huanacos live in a gregarious manner, and are seen feeding in herds, of one or two hundred, on the declivities of the snowy and solitary mountains of upper Peru. They are shy, vigilant, and have a centinel on an elevation, to announce the approach of footsteps. Garcilasso says, the male Huanacos are on the high cliffs, whilst the females feed in the bottoms, and when the hunters are descried, they snort, and if pursued, collect the females together, and drive them before. It is presumable, that the ancient Peruvians had no other species of dog, than what corresponds to our cur, or what the Spaniards call *gosques*, and the Indians *alco*, the word now used generally for dog. Their mode of catching the Huanaco in solitary instances, was by snares, made of twisted thongs, that sprang by the force of a bended sapling; a species of toil, in which they are to this day, extremely ingenious.

Molina says, that when the snows commence, the Guanacos descend from the Cordilleras, in search of food, into the plains of Chili, where they are hunted with dogs, but the young

ones are alone taken, in this way, as the old ones run too fast. They have also a mode of catching them by means of a sling, to which are tied two stones, fixed to two thongs, which, when whirled, entangle in the animal's legs and trip him up. The most common way is, however, to shoot them with slugs and balls.

Garcilasso * has left us the particulars of the Incas' great hunt, which we will succinctly relate. The Incas, or emperors of Peru, amongst their other appendages of regal grandeur, had a general hunt, which they called *chacu*, a word that means to inclose, *(atajar)* for they surrounded and pent in their game. In every part of the empire, individuals were forbidden to kill any game, excepting partridges, pidgeons, turtle doves, and small birds, which, by orders of the judges, were allowed for the table of the governors, and curacas, but this only in a small quantity. This enactment was made, to the end that the common people might not become lazy, and abandon their domestic occupations, for the amusement of hunting. The person who should infringe this law, was considered as having broken through the code of the Incas; so that in a country so prolific, it may easily be imagined, what a quantity of game was found.

* Com. Real. lib. 6, cap. 6, page 134.

When the breeding season was over, the Inca fixed on the province, that was to be the seat of his sport, carrying with him 20,000, or 30,000 Indians, more or less, according to the quantity of country, he intended to surround. These men, filed on two sides, with experienced hunters at their head, and encompassing, in a circuit, 30, or 40 leagues of chosen ground, gradually approached to a central point, always an unwooded and level range. They had long poles, with which they beat the bushes, and the brakes, and as they closed the circle, and their ranks deepened, it was not possible for any game to escape.

The wild and destructive animals, such as lions, tigers, &c. were killed by the hunters as they approached them; but often 30,000 or 40,000 Huanacos and Vicuñas, were found inclosed, at the contraction of the circle. The females of all Deer, of which there are several species, were let loose, as they had no wool; and all the males were killed, except the finest, largest, and those necessary for the successive breeds, which were also suffered to escape, and the meat of those killed was distributed amongst the common people. The Huanacos and Vicuñas, after being shorn, and some males also killed, were in like manner let loose. The wool of the first,

from being coarse, was divided amongst the lower classes, and that of the Vicuña was reserved for the Inca, who afterwards dealt it out amongst his officers and nobility, for no others, on pain of death, could wear cloth manufactured of it.

These hunts took place, in certain suitable districts, every four years, the time the Indians imagined was necessary, for the Vicuñas to attain their full growth, and to have their fleeces in a perfect state. The Incas presided in person, at the distribution of the meat to the poor.

The Huanaco, from being less timid than the Vicuña, is not so much attached to the solitude of the snowy summits, and descends to pasture on the plains; nor is it to be wondered, that they have penetrated as far as the extremes of the Patagonian coast, a country so destitute of water, when it is considered, that this animal scarcely requires drink; for like the Llama, it voids urine, though deprived of liquids for months, and though it have received nothing into its stomach, but moist and succulent plants, clipt perhaps at early dawn, with the dews of heaven upon them. Several of our navigators, who have gone ashore in the most southern extremes of the American continent, have been treated to haunches of Guanaco; but the Indians

of Peru do not esteem it so much as the Kid-Llama. The present mode of catching the Huanaco is with hounds, killing it with balls, or entrapping it in snares laid in the paths.

Dr. Shaw, in describing the Huanaco, says, that "it is covered, not with wool, like the other *smaller* species, but with long smooth hair." This must be greatly in contradiction to the plate he has given us, unless the animal is represented in its shorn state; but the fact is, that the coat of the Guanaco, like the other three species, is a combination of wool and hair, but from his greater exposure, it is more shaggy than that of the Llamas, though of the same length; and from being a coarser animal than the Vicuña, the under wool is neither so fine, so abundant, nor so little mixed with hair. Garcilasso, speaking of the Huanaco's fleece, uses the words, "*corta y aspera*," (short and harsh) so that Dr. Shaw's distinction has no reference whatever to this animal, nor is there in the plate he has given of him, any thing, that in the most distant manner alludes to the Guanaco, unless it is the name inscribed upon it.

Of all the descriptions, however, of the Guanaco, attempted in our own language, perhaps that found in the Arcana of Nature, No. 17, for May, 1811, is the most *outrée*. The

Alpaca is, in the first place, changed into a Guanaco, and then this animal is represented with the four legs bending forwards, the knees depressed inwards, and as a generic character, it is laid down half white, and half brown, as if in the Alpaca, to which the author alluded, this were not accidental; for had the animal been entirely black, from this being the most common colour, it would not have been so acceptable in Lima, where it was originally sent as a present. It was that beautiful variety that constituted the curiosity, more than the quadruped itself. The authors who wrote previous to our late intercourse with Buenos Ayres, are in some measure pardonable; but in the year 1811, when our merchants have had so many seroons of Alpaca wool, and Guanaco skins imported, and while there exists the authority of ancient authors, such confusions are unpardonable. In its proper place, we shall notice a similar transfiguration of the Llama into the Vicuña, that occurs in No. 4, of the same work.

As the Huanaco is the animal that produces the best bezoars brought from South America, it will not be thought irrelevant to our subject, to add a few particulars, respecting those singular

concretions so much famed in the *materia medica* of the ancients.

It is peculiar to the order of Pecora, or Ruminants, to form two species of concretes in the stomach, which, though they have the same origin, are nevertheless different. These are, the egagropiles, or hair balls, taken from the insides of horned cattle; and the others are bezoars, or solid stones, discovered in the Algazel and other quadrupeds of India and Persia, and in the sheep of Peru; but mostly in the Guanaco.

The first are found in the insides of the Cows, that feed on the pampas of Buenos Ayres, where they are extracted, of an enormous size; and we have at present in our possession one from that country, of a flat circular shape, that weighs eight pounds and a quarter; and measures two feet eleven inches and a half in circumference, two feet eight inches round the flat part, nine inches diameter also in the flat part, eleven inches diameter in the cross part; and on immersing it in water, we found it displaced from the pail, upwards of eight quarts, which makes its bulk, or solid contents, correspond to 462 cubic inches. This is the largest egagropile supposed ever to have been seen in England; but occasionally small ones, of the size of a turkey's egg, are found in our own cattle. On the upper and under flat parts, two holes were

visible, through which the concreted hair was noticed, and on being put into water, from the small globules of air that arose, it was evident, that being of a spungy nature, some water was imbibed by them. These holes appeared to have been adhering points to the intestines, but the outside coat was a perfect crust of a limy substance, smooth; but, on knocking, the ball had a hollow sound.

Bezoars are oval, sometimes round solid concretions, of the size of a turkey's egg, with no hair, but of a heavy lime-stone nature, composed of a number of concentric coats, or lamellæ, each adhering, but when broken, peeling off in distinct pieces. The outside of each is perfectly smooth, polished, lustrous, and of a deeper colour than the inside, so that they appear to have been formed successively in layers, one after the other. Their commencement, or *principium*, appears to have originated from something the animal has received on its stomach, without being able to digest it; for in those we have in our possession, the nucleus is a small flint stone, and the bezoar takes the larger form, of what this was in miniature. In others, the nucleus indicates to have been a piece of wood, or some fibrous matter, that has not found passage through the vessels of digestion.

The whole four species of Peruvian sheep occasionally produce these concretions, but the real bezoars are seldom found in any but the wild kinds; for in the Llama they rather become egagropiles, from the quantity of hair he eats from his crupper, which is most noticed in the rutting season of the year; and this has caused some authors erroneously to establish, that at that period his coat dropped off.

The Indians of Peru, to this day, are strongly impressed with the idea, that the bezoar originates from the animal feeding on certain poisonous plants; and Feuillée received the same accounts from them. This is a point well worthy of clearing up, and the author we have quoted, was desirous of establishing it; but the Guanaco he dissected, either from being taken from its native range too young, or not having any obstruction in the intestines, as a primary cause, was not found to contain a bezoar. He appears, however, not to have disputed the authority of the Indians; and though at first sight it seems a paradox, that animals should be nourished by a subtle poison, and that this should afterwards produce a remedy, so long considered valuable, yet this is partly reconciled, when we reflect, that the Goat and the Quail preferably feed on, and are fattened with hellebore, notwithstanding it is poisonous to man;

and even parsley, we have ourselves more than once noticed, in the West Indies, is an immediate poison to parrots, although the hare and other animals are extremely fond of it, and it agrees with them. Lucretius appears sensible of this fact, when he says,

Ut quod aliis cibus est, aliis fiat acre venenum.

Lib. 4.

The French naturalists incline to think, that in Asia and Africa, certain classes of quadrupeds produce the bezoar, from feeding on the mountains, where the strength and activity of the plants are great, and that they thence constitute a kind of residuum. The animals of the mountains of Europe, where the quality of the plants and herbs is more temperate, according to Mr. Buffon, produce nothing but egagropiles, of no virtue, which only contain hair, roots, and filaments, too hard for the digestion of the animal.

In the mountains of the torrid zone, other animals besides the Huanaco and Vicuña, produce them; and *Acosta, His. Nat. de Indias Occidentales*, page 207, says, that the Stags, and even Squirrels, contain them. The two wild kinds of Peruvian sheep afford them in nearly an equal proportion, though it has been generally thought that the Vicuñas produce most. In medicine and trade, they are called the occidental bezoars,

but though larger, they are not so much esteemed as the oriental ones. Those in greatest repute are of a dark green colour; but notwithstanding they were formerly considered as a most powerful alexipharmic, their virtues in Europe are now held as imaginary, and they are for that reason almost discarded from modern practice. In South America they however keep their ground, and their efficacy was highly appreciated by the ancient Peruvians, who were extremely jealous of the Spaniards obtaining any knowledge of their acquirements in medicine.*

The Indians formerly, and even partially to the present day, use a composition made of the bezoar stone, powdered, amalgamated with some other ingredients, and then baked into cakes, to rub off the beard from their faces, in the way that a pumice stone might be applied. This custom is

* The obstinacy with which the Indians endeavoured to conceal their acquirements from the Europeans, may be collected from a document by Pedro de Osma, dated Lima, 1568. In this paper, he states, that having left his house, with several friends, in order to discover the part in which the bezoar stone is engendered in the Vicunas, the Indians not only refused to answer the different questions proposed to them on the subject, but likewise would not consent to disclose the secret of the poison they carried about with them. These secrets having, however been revealed by a young Indian, his countrymen expressed a wish to cut off his head, which they eventually did.—*Mercurio Peruano.*

yet found prevalent, in those parts of the interiour country that are not yet civilized, where the ancient usages and customs remain unchanged.

As before noticed, Pere Feuillée is the only author who has given us the dissection of the Guanaco; and as from the similarity of bodily construction, and general outlines, it will convey ideas of the internal organs of the whole four species, we will here subjoin the result of his remarks.

Our author observes, that the system of fermentation would, in great measure, explain the digestion of the Huanaco; but adds, that as that of trituration will more evidently point out the cause, it is under that light he has considered it.

The first part of the animal examined was the œsophagus, and afterwards the ventricles, which, as in other similar animals, were found composed of four tunics.

The first, corresponding to the œsophagus, is a production of the pleura; and the first belonging to the stomach, is a prolongation of the breast. The second is a hollow muscle, which gives to these parts the force and facility of moving, or the action they exercise. This muscle is composed of two different assemblages of fleshy fibres, one of which is exteriour, and the other interiour, the latter being the most considerable in the ventricles, as it there acts with the greatest force.

THE third tunic, or membrane, is of a moderate thickness, but extremely close formed, and in it are inserted, as in an aponeurotic tendon, an infinite number of the fibres of the fleshy tunic of the stomach, which is placed above. It is this membrane that sustains nearly all the ramifications of the blood-vessels, which, by the mutual union of their branches, form a kind of bag. This union causes it to be viewed as a close tissue composed of tendonous fibres, twisted with an infinity of nervous ones, of the eighth pair, together with blood-vessels.

THE fourth, or interior membrane, covers the internal cavity of all these parts. It resulted from the examination of this villous coat of the stomach, as well as from the intestines, and gall-bladder of the Huanaco, that this membrane was composed of an infinite number of blood-vessels, of extreme delicacy, and scarcely visible but with the microscope; and it is presumable, that none but the most clear lymph can pass through them.

THE two bands of the œsophagus are composed of fleshy fibres, that diverge from the same place, descend spirally in opposite directions, and after taking a half turn, towards the opposite side, they then meet. In this meeting, the fibres cross each other, so that those which were before exteriour, become interiour, and so *vice versa*. Con-

tinuing on in the same peristaltic and spiral direction, these same fibres cross again, and those which so lately had become interiour, are again placed exteriour. This mechanism continues the same, till it arrives at the base of the œsophagus, which opens between the first and second ventricle.

These fibres, the spring of which is excited by the presence of the aliments, successively close the œsophagus, so that its motion is sometimes peristaltic, to force the aliments into the stomach; and sometimes antiperistaltic, in order to oblige the same aliments, to ascend from the stomach to the mouth. This last motion, which in most animals, is nothing more than an effort, by which nature endeavours to rid herself of an importunate weight, or of some inimical substance, becomes, in ruminating animals, a necessary means, by which nature exposes a second time, those aliments, which before had only been grossly divided, not only to the action of teeth, and of the dissolvents, which accompany it, but again to the efforts and pressure of the œsophagus. This muscle by the force of its successive movements, compleatly bruises, masticates, and mixes the aliments, which in the first instance, had been only subdivided by the first action of the teeth, that they may be a second time pre-

cipitated into the stomach, preparatory to digestion.

The first ventricle, commonly called the paunch, was next examined, which in the Huanaco is of an extreme thickness. Pere Feuillée had been informed by the Indians, that it was in this, that the bezoar was formed, but he found it to contain nothing, but a great quantity of undigested food, attributed to the causes already enumerated.

Two exterior furrows, to which internally correspond, the same number of edges, thick, and covered with points, divide this ventricle into three parts of a sphere, and a third one, that seems to advance, in appearance like the two preceding, separates this first ventricle, from the second. At the bottom of these furrows, is a considerable number of fleshy fibres, and from thence the greatest part of those belonging to the stomach, derive their origin.

The fleshy fibres that compose the two folds of the second tunic, are orbicular, and not spiral, as Payer imagined, indeed some of them, that cross each other in certain parts, from being exteriour, and then becoming reciprocally interiour, and so vice versa, approach a spiral figure, which deceived this author.

The internal surface of this ventricle is entirely covered with points, or solid eminences, of different size and shape. They appear like so many files, and as productions of the third tunic, being guarded as it were by the villous membrane, which receives them in an equal number of dents.

The second ventricle, called the reticulum, is not so large as the first, though its construction is nearly the same, and it is furnished with internal folds, that have the appearance of so many little walls, the plan of which is perpendicular to the surface of the ventricle. These walls or elevations, form in their concurrence, a bag, the mesh of which is raised, and disposed like the cells of a honeycomb, but less regular, some being square, others pentagonal, and others again hexagonal. These plicæ or folds are indented, like a small saw, and surmounted with a number of points, inferior in length, to those which are in the cells of the bag. These same plicæ, as well as those of the third ventricle, are duplications of the third tunic, intertissued with moveable and fleshy fibres, covered with the villous coat, or fourth membrane.

Two eminences, or longitudinal lips, strong, greatly raised, and situated parallel, form a canal, that is mutilated and imperfect, when

these two lips are not closed. This canal continues the length of that portion of the ventricle, which corresponds to the diaphragm. It extends from the under part of the œsophagus, where the cavity appears to prolong, as far as the third ventricle, in which this said canal opens with the second, by a small aperture, studded with a number of points, that protect the common entrance. These lips, in the duplication of the membranes, of which they are formed, inclose a collection of fibres, or rather a muscle that follows the direction of the lips; and circularly one extremity embraces that part which constitutes the middle, between the œsophagus and the stomach, and the other extremity adheres to that portion of the second ventricle, contiguous to the entrance of the third, where it is visible that the two edges continue. This construction, yet only partially developed, gives rise to a singular mechanism, destined for important purposes.

The under part of the œsophagus, as well as the entrance of the third ventricle, and of consequence, the two extremities of this oval muscle, are rather strongly fixed, to the end that its contraction may not affect them. The lateral portions thus receiving more tension, alone extend in a straight line, and of consequence close the two lips, in order to form a perfect canal, by

shutting the under part of the œsophagus, and by hindering the communication of the second ventricle, with the third; whilst the cavity of the œsophagus, is by that means extremely prolonged, even as far as the third ventricle. Lacteous aliments and all fluids, flow freely in this third ventricle, by means of this canal, notwithstanding that some particles escape through the lips, and fall into the two first ventricles; at the same time, that the prodigious quantity of nourishment, which these animals swallow with so much precipitation, that it has not time to be sufficiently masticated, forces the resistance of the muscle above mentioned, and causes the food to fall into the first and second ventricle, till the animal reposes, and can ruminate with freedom. Then by an effort, similar to that by which we chase wind from the stomach, the animal opposes the distended diaphragm to the action of the muscles of the lower part of the belly, and this pressure, diminishing the capaciousness of the stomach, obliges the most masticate d portion of the aliments, contained in the second ventricle, to flow into the third; the entrance of which, being closed, and armed with points, rejects all that is yet too coarse; at the same time that the food, which before has only received a small change, and mostly abounding in the paunch,

yet partly in the reticulum, passes freely through the œsophagus, to undergo the preparations already noticed.

From what has here been explained, it is easily deducible, that the paunch and reticulum are not confined to act as a reservoir for the food, but that their action goes further. In effect, they are like so many hollow muscles, of which the fibres excited and agitated by the presence of the aliments, move successively in opposite directions, and roll, mix, and attenuate whatever is inclosed within them.

It is difficult to account for a number of small eminences, of a different nature, differently inclined, strong, solid, and armed like so many files, with an infinite number of teeth; sustained by strong, and thick muscles, besides a considerable number of plicæ, and double folds, which the peristaltic movement of the stomach produces, and effaces. Possibly these are so many instruments, which, agitated in opposite directions, and vigorously but regularly moved, cut, macerate, and mix the aliments, of which the coarser particles, embarrassed by the point, or meshes of the reticulum, are naturally presented to their active influence.

Besides, the stomach being continually moved and agitated by the diaphragm, and the

muscles of the belly, ceding to the efforts caused, these partitions approach each other, and pressed by the muscles, they meet backward and forward, creating an alternation of movement, suitable to the maceration and mixture of any matter.

At the same time, however, that the food is macerated by the solids, it is also penetrated by the liquids, which concur to aid digestion. The salivary juices, those which exude from the membranes of the œsophagus, and from the stomach, notwithstanding it is divested of glands, soften, break, and penetrate the aliments; the fluids even, which the animal drinks, aid to complete this operation, whilst the action of the solids contributes to the same effect. The food thus worked, passes into the third ventricle, and proceeds on, through the different stages of digestion.

We have followed Pere Feuillèe through the course of his observations, on the interiour construction of the Huanaco, from considering it intimately connected with our subject, the object of which is, to illustrate every part of the natural history of these quadrupeds, and the peculiar composition of their organs of digestion, are certainly material points. Their developement, at the same time, affords a contrast, with the rumi-

nating animals we have amongst us; and though these are parts uninteresting to the general reader, they will not be considered so, by the man of science.

THOUGH we have entered at some length, on the description of the Huanaco, we nevertheless consider it by far the least interesting of the four species of Peruvian sheep, and of consequence, its introduction into England could be attended with no other advantage, than that of a curiosity. From its fleece being the coarsest, the most shaggy, and least valuable, it would constitute a variety, but the expence and attention necessary for its importation, and naturalization, would be more amply compensated by being bestowed on the Vicuña, for the reasons we shall now proceed to subjoin.

To our figure of the Guanaco, we have added that of an Indian warrior of the uncivilized tribes of the interior, in his usual dress, &c. The Indian is represented with a species of sandal, called by them *ucuta*, and by the Spaniards, *hojotas*.

THE VICUÑA,

OR,

VIGONIA.

THE *Vicuña* of the Spaniards, the *Wicuña* of the Peruvians, *La Vigogne* of Buffon, the *Camelus-Vicugna, corpore lanato lævi, rostro simo obtuso, cauda erecta*, of Linnæus, is by far the smallest, most delicate, and from the fineness and consequent value of its wool, the most interesting, of the four species of Peruvian sheep.

THE ordinary stature of this animal is three feet to the top of the back, and it seldom exceeds that height. We measured the one belonging to Mr. Polito, at Exeter 'Change, which is of a common size, and found, that it was two feet eleven inches high, to the central part of the back, two feet seven and a half inches to the top of the fore shoulder, where a considerable depression is noticed; and two feet four inches, from the chest to the rump. It is therefore inferior to the other three species, both

Vicuna.

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in stature, corpulency, and strength, and appears to be to them, what the roe is to the stag.

The same arch in the belly, and tapering waist, observable in the three kinds already described, occur in the Vicuña; and the measurement of the one already alluded to, amounted to two feet, nine inches, in the girth, by the legs; two feet, six inches, in the middle; and one foot, eleven inches, in the waist. The construction of the genital parts is the same as that described in the Llama, but the Vicuña is less retromingent, and the obstructions to copulation are consequently not so great.

The head of the Vicuña differs considerably from that of either of the two tame kinds; it has the appearance of being proportionably too large for the size, and delicacy of the rest of the body, is much rounder, tapers suddenly to a very small point at the snout, so that the mouth and fent lip, are extremely diminutive. The forehead is rounder, more elevated, and the whole head is covered with a longer, and more curly down, of a reddish colour, corresponding to the general fleece, and not mouse-coloured, as in the Llama. The nostrils are also very small, but the teeth are on the same plan as those of the others, and are as they appear

in miniature, but the upper gums are black. The ears elliptical and pointed, rather diverge at the extremes, bending outwards, and are carried less erect than in the Llama or Alpaca.

The Vicuña, in common with the Guanaco, is more yaw-necked, than either of the two tame kinds, and as we have before observed, partakes of none of their gracefulness. There is an extreme depression at the root of the neck, and it is proportionately very slender. No callosity is found on the sternum, nor corns on the pastern joints of the hind legs. The limbs are extremely delicate, and, as in the whole four species, appear too long for the size of the body. The cleft feet are small, have the same spurs on the fore parts, as the rest, but are not proportionably so large, or so much curved, as in the Llama. The tail is more switching, the hairs in it more straggling, yet it is by no means erect, as most naturalists suppose. The skin has the same hard touch, when felt through the fleece, attributable to the other kinds.

The uniform colour of the Vicuñas fleece, is of a russet red, or red brown; for the few exceptions that have been seen white, constitute trivial varieties; but this animal was never yet found black, or party-coloured, which makes the general confusion with the Paco the more

astonishing. The wool of this animal, is the softest, finest, most silky, and when well picked, we may add, the most valuable in the world. It is more estimable than the down of the Canadian beaver, the fleece of the *brebis des* Calmoucks, or of the Syrian goats. It extends from the fore shoulder, all along the back, rump, and upper flanks, unmixed with hair, in a perfect tuft; but, under the belly, the hair out-tops, and continues to emerge through the fleece, along the lower flanks, thick, shaggy, about three inches long, as if to replace the want of the callosity on the sternum, and to protect the animal in its resting position on the breast, which often comes in contact with the flakes of snow and hoar frost, that cover the pendant sides of the ranges, where it mostly dwells. The fleece of the under part of the belly, is of a white colour, and there are several other white shades, better seen, and understood, by a recurrence to our plate.

The general appearance of the Vicuña, is rather ungraceful, compared with the other three species, for it has neither the erect and majestic aspect of the Llama; the soft, expressive looks of the Alpaca; nor the spirited, and independent carriage of the Guanaco. Its eyes are black, but they are unmeaning; they

are rather round, than oblong; and the pupils project, which gives the animal a degree of vacant stare.

The Vicuña ruminates in the same manner as the three species already described, but seems to abound much more in saliva, and when troubled or vexed, it spits with great acrimony, and acidulous stench; but it equally abstains from drink. Notwithstanding there is no guard to the breast, which appears as a distinctive mark to the two tame kinds, the positions of resting thereon, are the same. It has not been remarked of either of the four species of Peruvian sheep, like the deer, and other quadrupeds of that nature, we have amongst us, that they browze on the tender shoots of the thickets, and small shrubbery; for they in general feed on the heath, broom, and short grass, found on the tops of the mountains. They do not eat with that great avidity as the Llama, nor interfere with the pursuits of culture; they seem content, with the often too scanty allowance, they can pick, on their frigid downs.

These animals are inhabitants of the *sierras*, and snowy regions of upper Peru, and in the solitary ranges of the secluded mountains they live in a gregarious manner. They are found in similar situations with the Guanaco, often

herd with them, and, of late years, it has been thought, by the Indian hunters, from an inferiour Vicuña skin obtained, that they intermixed occasionally. They are not so numerous, however, as the Guanacos, from being more hunted, and they are also, possibly, from this very reason, more shy and difficult to approach. The introduction of fire-arms, must have greatly contributed to their natural timidity, and to avoid the pursuit and slaughter of the hunters, they often resort to the fastnesses, and inaccessible places of the mountains, occupying the deepest shades of the glen, and the most elevated ridges of the snow-capped Cordilleras, where they enjoy plenty of air, freedom, and solitude.

TIMIDITY is particularly characteristic of this animal. The instant it perceives a passenger, or any moving object, it stops, and, as it were, in a kind of astonishmeut, is riveted to the spot, in which position it remains, till the object disappears.

SEVERAL authors having given us the particulars of the mode of hunting the Vicunas, representing it to consist of a large party turning out, in the way mentioned in the Inca's hunt, and surrounding a range of country, in order to drive them into some narrow defile, where a

cord was suspended, on which were hung pieces of coloured cloth. These waving to the wind, intimidated the animal in such a way, that it did not dare to pass on, and frank this imaginary barrier. But if it happened to be a herd, they crowded together, and were easily killed in considerable numbers by the hunters. This must, however, have had reference to some ancient mode of killing them; for it may easily be imagined next to impossible, to hem in animals, fleet and timid, with open and extended ranges before them, unless by numbers; whereas, for many years back, the hunting and killing of the Vicuña has been prohibited. When it has therefore been taken, it has been by stealth, and as it were, by contraband measures, in which numbers could not be comprehended.

This mode, therefore, can have no relation whatever with the present one, of catching and killing of the animal, which, in few words, we will here subjoin. Notwithstanding it cannot be expected, that any vigilant police, can be extended to the interiour of such immense ranges of country, as those where the Vicuñas' herd, and solely occupied by Indians; yet there is sufficient to make the hunting of them, as we just noticed, an occupation of some privacy,

and only followed by small parties, who go out in quest of skins. When these parties get to their ground, they generally divide themselves, and one endeavours to attract the notice of the animal, in a windward direction. The object once fixed, and the notice of the herd sufficiently attracted, the hunter, who has this charge allotted to him, remains in a moving posture, but without approaching, and the unwary animals continue to look at him stedfastly, unmindful of their danger, whilst his companions have time to leave their ambush, make a contour, and come up in the rear.

They fire as much as they can together, but sometimes according to convenience; for the fleetness of the animal seldom affords them a second shot. If it is a herd, each marksman generally drops one, for their dexterity and great habitude to this species of sport, seldom afford instances of their missing; indeed, the Indian hunters are excellent shots. The fine sense of hearing, remarkable in the Vicuña, as well as their timidity, make it necessary for the shooters to approach them, with the greatest caution, in a leeward direction, and against the wind, for which reason their notice is attracted from the opposite point; for the least noise or rust-

ling of the trees, alarms them, and they betake themselves to a precipitate flight.

The hunters then skin what they have killed; if it be meal time, they dress the choicest parts with salt and peppers, which they always carry in their pouches, and leave the rest to the vultures, who have often devoured their share, before the party proceeds. Should they happen, however, to have brought with them, an ass, or a mule, as a beast of burden, laden with salt, one of the hunters is left to cure the best carcases, and make them into *charque*, which serves them to supply their families, or to dispose of, at a cheap rate, to the nearest villagers. The skins and meat were collected in little huts or *bojios*, which they make out of the boughs of trees, where they pass the night. The party generally stays out on their hunt, ten or twelve days, according to the luck they have met with, and then return to their hamlet, loaded with their spoils. They also sometimes use dogs in their chase. The Vicuña generally weighs from 75, to 100lbs.; which is not quite so much as half the weight of the Llama; for these are often equal to 250lbs.

The venison, or meat of the Vicuña, when in season, may be considered as very good eating, but not so rich and savoury, as one would

expect from a wild animal, from the cleanliness of its food, and the quantity of fat with which, in common with the other three species, nature has gifted it. The Indians do not like it so much as the young Llama, but nevertheless feed on it, and make it into stews, in which they put rice and peppers. It is by them thought, not only healthy, but even medicinal, and Acosta has, at some length, enumerated the virtues of the Vicuña flesh. The skin is carried to market, and sold for about three or four rials (2s. 3d.), and each generally yields ten or twelve ounces of good clean wool, cut from the back, rump, and sides; besides six or eight ounces of an inferior quality, partly mixed with hair, cut from the belly and under the flanks, which is packed with the Guanaco wools, as we shall more fully notice, when we come to treat distinctly of those of each. The skin is eventually manufactured into a soft shoe-leather, like Morocco; it is also used for some domestic purpose, but appears of a good texture to be made into gloves, &c.

According to some particulars we have found in the *Semanario de Buenos Ayres*, Vol. III. it was not till the year 1799, that white Vicuñas were discovered on the snowy ridges of San Antonio de Lipes, where thirteen

were seen pasturing. Six others were afterwards observed in those of Ubina, and a premium being offered for some of the skins, they were soon brought in by an Indian hunter. This important discovery bids fair to be an interesting improvement in the wools of that animal, and is a material addition to our limited acquaintance with its natural history. We have since been informed, by natives of the country, that small parcels of white Vicuña wool, have been obtained, and manufactured into shawls, of a beautiful texture, and capable of rivalling those of Cachemire.

In Chili, according to Molina, the Vicuña is found most abundant in those parts of the Cordillera, that border on Coquimbo and Copiapù. By the custom-house returns of that country, we find, that 2000 skins, in wool, are annually exported from the first-mentioned port; to that of Lima, invoiced at ten rials each; but this is not equal to a tenth of what is used in the province. It would not be possible, from the occult manner in which this animal is killed, to form any accurate statement of the numbers slaughtered annually; but a South American, of considerable local knowledge, judging from the quantity of Vicuña wool, manufactured and exported, gave, as a conjecture, that 250,000

perished every year, by the hands of the hunters. If we add to this, the number slaughtered by the wild beasts of the forest, and those that fall a prey to cutaneous disorders, to which they are sometimes exposed, the destruction of the animal exceeds its propagation, and it is generally believed in the country, that not one-seventh of the numbers at present exist, as were supposed to be in the time of the Incas; who, as we have before noticed, were extremely provident of this race.

The Huanaco and Vicuña, from being unrestrained, and in a state of nature, have of consequence extended much more than the two tame kinds; from Peru, they have gone, by way of Atacama, along the cordillera of the coast, through Chili.

It would be difficult to unravel the many multiplied confusions, that have been repeated by the several naturalists who have treated of the animals under consideration, which have in great measure originated from Buffon, Bomare, and other French writers, not distinguishing between the tame and the wild races. These are, in fact, a different genus, of the same tribe; but their exteriour construction, size, colour, properties, and a variety of other distinctive marks, constitute them as perfectly different a race, as is the

Zebra from the Quagga; the Horse from the Ass, placing them in the light of varieties, existing in allied animals. These confusions are the more to be wondered at, as the ancient Spanish authors are very impressive in this particular. In the sketch we have given of the Inca's hunt, as well as in the relative details of the three other kinds, general ideas of the Vicuña are collected; but our accompanying plates, copied from life, will present the most just contrast, and afford an apportunity of judging in what the four races mostly differ; but the wools of all, as well as the domestication of the wild kinds, and the crossing of the breeds, will be separately treated. To our figure of the Vicuña, we have added that of an Indian female, in her usual dress, in the attitude of spinning. Their clothes are made of stuffs and camblets, often manufactured by themselves, or out of cottons, extremely well dyed, with vegetable colouring. The men, as represented in our plate of the Guanaco, adorn their heads with feathers of the parrot, which they find red, green, and of all colours, and the lower parts of the body with those of the ostrich.

The "Arcana of Nature," No. IV. for April 1810, asserts, "that the Paco, or Vicuña, of South America, is one of those animals

which was used formerly as a beast of burden, by the Indians." This is the most glaring confusion of the kinds we have yet seen deduced from this general want of descrimination, for the idea of making the Vicuña a beast of burden, would equal that, of turning our sheep to such purposes. It can only be equalled by the author of the same article, giving us a drawing of the Llama, and affixing the name of Vicuña to it. The French must naturally smile at such mistakes, as they did at Freziers calling the Guanaco a Viscacho, which is in reality, nothing more than a rabbit.*

With an equal misapplication of truth, does the same work, No. 17, affirm, "that the Vicuña is now common enough in England." The only specimen we have been able to discover, in this country, belongs to the Exeter 'Change collection, from whence we imagine, the author must have meant the Llama, for that assertion, with regard to the former, as it implies domesticated ones, would not apply even to any part of South America. We should be happy in felicitating the country with such an interesting circumstance, if it were true; but even the Llamas that have hitherto been brought over, have been

* See Frezier's Voyage to the South Seas, page 139.

very few. The only ones we know of, are a female in the possession of her Royal Highness, the Duchess of York, a pair belonging to Mr. Tharpe, Chippenham park, Cambridgeshire, one at Exeter 'Change, and a male, owned by Mr. Cross, and exhibited in Piccadilly, which last is the finest imported specimen we have yet met with.

We cannot but express a regret, from the premature manner, in which we have been induced to publish this little essay, that there are many interesting particulars respecting the Peruvian sheep, of which we are not at this moment possessed, but which, at a future period we hope will reach us. To several South Americans we are indebted, for the solution of those doubts, that have occurred during our progress; but after the pains taken, we were extremely desirous of manifesting the results of some experiments, made some years ago, to naturalize the Vicuña in Spain. Those particulars are contained in *Don Gaspar de Escalonás Gazophylazium Regium Peruvicum*, fol. Madrid, 1775) but the recurrence to this work, which we could only find in the possession of an illiberal Spaniard, was refused to us.

La Sociedad de los amantes del Pays, established in Lima, from whom is derived some of the most interesting matter of a recent date,

respecting South America, edited in the Mercurio Peruano, amongst the variety of subjects they were in the habit of allotting to the discussion of their respective members, and most congenial to their talents, had designed a memoir on Peruvian sheep, but unfortunately the publication of that work ceased, from a variety of contingencies; and the world was thus deprived of a treatise, that doubtless would have thrown great light on the natural history of this valuable race of quadrupeds.

GENERAL REMARKS

On the Domestication of the Vicuna, and the crossing the respective Breeds of Peruvian Sheep; together with Ideas on the Intermixing of the Vicuña, with the common Sheep.

FROM periods of remote antiquity, the nations of Europe, have paid particular attention to the article of wool, and Spain was amongst the first, to consider it with a degree of predilection. No sooner had the Phœnicians, taught its inhabitants, the advantages of trade, than they became desirous of increasing the natural productions of their country, and their attention was thereby called to their flocks. Alonzo the eleventh, as early as the year 1347, issued a decree, by which he declared all flocks under his immediate, and special royal protection, and many of his successors, inherited the same patriotic spirit. How long this has been considered one of the staple commodities of this

country, and the advantages that our inhabitants, have at all times, derived from its growth and manufacture; is a subject that has so lately engrossed the attention of the public, that further particulars upon it would be here superfluous.

The same principle of economy, was in theory extended to South America, as soon as the wools of that country, were duly considered in a national light; but unfortunately, the regulations that tended to their encouragement, were never carried into effect. The Alpaca and Vicuña, of which we have already given profuse details, and whose wools are so valuable, are, as before observed, indigenous in most parts of upper Peru; and had they been locally attended to, would certainly have constituted valuable sources of national wealth, to those interiour provinces. Numerous have been the regulations prescribed by the council of the Indies, to hinder the killing of the Vicuña, for the purpose of obtaining its wool; and repeated orders have been issued to have it tamed, to the end that, in a domesticated state, it might be shorn. As this was, however, the work of time, and could bring no immediate advantage to a viceroy, whose administration was limited and of short duration, the subject died away, when he arrived at the seat of

his government, or else his attention was absorbed by other means of accumulating wealth, more immediate and prolific.

EXPERIENCE has taught us, that, in almost all instances, in which the animal is not fierce, or armed by nature for assault, it can be tamed. It is a fact, of which we have the evidence within ourselves, that the Vicuña, when taken young, can be tamed and domesticated, in such a way, as to become an inmate of the cottage, and serve as a companion for children to play with. We have even been assured, by a Peruvian of credit, that the young Guanaco, which is more harsh in its manners, and independent in its disposition, has been reduced to such a state of domesticity, that it would go to feed on the neighbouring hills in the day time, or play round the village, and regularly return in the evening, to the place of its abode. A late Spanish work also mentions a farmer in Quillota, in Chili, having 20 Guanacos, so tame, that they went in the day-time to pasture alone, and returned at night.

THIS would therefore indicate, the possibility of the Vicuñas, on a large scale, being tamed, by their being formed into small flocks, and kept in inclosures; by which means, the third, fourth, and successive generations, would be ac-

customed to their subjection. In the solitary instances that have occurred, in which they have been rendered pets and familiars, it has been proved, that if they have sought to regain their freedom by flight, it was at that peculiar season when nature impels them to the conservation and propagation of their own species; when not finding the congenial objects with which to co-operate in this instinctive call, they have naturally gone in search of those wandering flocks, from whence they originated, and which pasture on the snowy Cordilleras, possibly in sight.

Nor can the opinions of several travellers, amongst whom we may rank Ulloa, be considered infallible in this particular, when they assert, that the Vicuña always pants after its liberty; for, on mature examination, it will be found, that even up to the present day, the solitary examples of domestication, that have occurred in Peru, scarcely afford an instance, how much this restless spirit would be diminished, in the second generation; for the economist of that country, will in candour confess, that, since the time of the Jesuits, he does not remember a serious attempt to carry this important branch of rural economy into effect, and of consequence, there has been no opportunity of judging, what would be the habits, and dis-

positions of descendants, born in a domestic state.

It has long been projected, as a sure means of furthering so desirable a scheme, to free every Indian from tribute, who should produce proof, that, on his farm, he had ten Vicuñas, in a domesticated state. This would, certainly, be a small sacrifice on the part of the Spanish treasury, and be a certain means of laying a solid foundation; for whoever has had an opportunity of observing the patience, and dexterity of the Indian, in handling the Llama and Alpaca, will allow, that he is the most proper person to effect the docility of the Vicuña; and the stimulus of an exemption of this nature would make him redouble his endeavours. By this means, a company might be formed annually, to collect the scattered few, in possession of each individual, and form them into flocks; and severe penalties being enforced against those, who should kill or hunt the wild ones, the tame ones, by degrees, would be multiplied.

The mountain Indian, from his childhood, is the companion of the Llama and Alpaca, he knows their habits and wants, and it is he alone, that can manage their capricious dispositions, as beasts of burden, so as to render their services useful. Many similar characteristics might

perhaps be discovered in the Vicuñas, when domesticated; for every animal has its peculiar mode of treatment. These, the Indian would at first have to study, but he would consider the exemption from tribute as an invaluable pre-eminence; not so much from its intrinsic value, as from the unfavourable ideas and opinions of prejudice, attached to this exaction. It would, besides, relieve him from vexations, experienced from his respective caciques, in its collection, which is, in fact, the most onerous part.

This arises from the Indian being improvident; he seldom thinks of the payment of his annual tribute, till the moment of exhibiting it arrives; when, as he has not the amount collected, the cacique, who superintends the district in which he lives, and who is charged with the collection of the tribute, oppresses him, and in conformity to a provision of the laws, binds him out for one or two months, or the term requisite to earn it, to a farmer, who, in the mean while, pays it for him; a hardship he feels more than the loss of property; and more than if the penalty was inflicted on him, by a white. Thoughtless also, and unconfiding, the Indian, in many cases, would not perhaps so much rely on the promise of future exemption of tribute, as he would be urged to the accomplishment of the object de-

sired, by receiving a premium in some of those trifling luxuries, he so much prizes, and that cost so little. This might be presented to him, by the hand of his spiritual pastor, whose influence over him is well known; and we can with confidence add, that if the country had not been deprived of the useful services of the Jesuits, besides many other stages of civilization, which the secluded inhabitants of those regions, would, ere this, have attained, the grand object of domesticating the Vicuña, would long since have been effected; for at the time of their expulsion, they had 600 in a tame state, in their inclosures. They saw the importance of the scheme, both for the country, as well as Europe; they were convinced of its possibility, but the measure died away, as soon as they were gone.

No other plans that can be suggested, promise so much probability of success; for the repeated prohibitions, and edicts, not to hunt and kill the Vicuña, have uniformly been evaded, from the retired, and secret places, to which the hunter resorts to obtain them, as well as from the high price of the wool, which in Cadiz, on an average of several years, has sold for seventeen rials, or nine shillings per pound. These are temptations that have hitherto over-leaped every barrier of the law, and rendered every

passive measure, on the part of the government, ineffectual. The repeated fraud, that was for a long time practised, of mixing the best Guanaco wool, with that of the Vicuña, to increase the quantity (which was possible from a resemblance of colour), made it of late years necessary, for the Indian hunter, to deliver in the unshorn skin, to the purchaser, so that the plan of destruction was by this means increased; but besides the advantages that would result to the country at large, from the proposed system of domestication, when once collected into flocks, and a proper governmental inspection, established on the package of the wools, with accompanying certificates of its quality, the confidence of the foreign merchant would be restored, and these frauds would be avoided.

The yearly and regular shearing of the animal, would besides give the wool a degree of consistency, which it has not, would cause it to lose part of its looseness of texture, that renders it less suited for the manufacture of cloth and hats, would divest it of a large portion of hair, and of consequence, add both to its value, and cleanliness.

Nor is the Alpaca wool, so much neglected, less deserving of notice, or less capable of improvement. The Indian from time immemo-

rial, and prevailing custom, prefers, as we have before noticed, having his flocks all black,* from this being the colour in which he is usually cloathed; but were a premium, similar to the one already announced, to be held out to each herdsman, who should annually breed thirty, or forty white Alpacas, this would be a means of having the colour extended, the number of white ones would be gradually and progressively multiplied, and this colour from admitting any other tint, is in Europe the most desirable. It would also be a considerable improvement, for that part of the fleece, situated on the neck, to be shorn and packed apart; it would from its fine and soft texture, be nearly as valuable as the fur of the beaver in the manufacture of hats, and if white, would easily take the colour required, and be employed in the manufacture of the finest shawls, the loom could produce.

The Indian, would at first be much opposed in point of prejudice, and imagine as much difficulty in breeding a flock of white Alpacas, as he would in taming and domesticating a dozen of wild Vicuñas; from the generality of

* That this may be the better understood, we may add, that out of seventy seroons of Alpaca wool, imported by a friend into the port of London, two only were white, the rest being black, and a very small proportion grizzled.

the former being black, brown, grizzled, or party-coloured, because he blindly imitates the customs of his ancestors, and is an enemy to innovation. When once urged, however, by this stimulus, which alone can rouse him, his energies would soon be called forth; and were this inducement found insufficient, a most powerful one yet remains, which is, his exemption from the mita;* from the adoption of which measure, besides the tie of favour, a national advantage would result, more than adequately compensative of the sacrifice. To produce white flocks, of either Llamas or Alpacas, requires nothing but the care and discrimination of the shepherd.

How little these two valuable branches of public and individual wealth have been at-

* This is the personal labour of the Indians, who perforce, and in proportion as they are assessed, are called out to work, at the king's mines of Potosi and Huancavelica, under the penalty of thirty dollars. There are also *mitas de merced*, or such as are granted by the viceroy to certain rich miners, in the provinces distant from the royal mines. Viceroy Toledo, in 1582, was the first who established this regulation, and the *mitayos* are assessible from the age of eighteen to fifty. The lot falls on each every seven years, for four months; so that during his life, the Indian works in the mines eighteen months. He receives twenty rials, (11s. 3d.) per week, and half a rial for each league he may have to come, to pay his travelling expences.

tended to in South America, must appear evident to every merchant, or manufacturer, who has an opportunity of seeing the state of the wools, that arrive from that country; and were they to establish the occupation of a stapler, it would give them an incalculable advance; for in this country, duties are paid on what, when picked from the fine parts with which it is mixed, is rejected from the loom, besides the expence of culling, which is here five times as great, as it is where the article is grown.

That principle of economy, by which the breeds of sheep, and their wools are improved, seems to have died away in Spain, and not to have extended to South America, in proportion as it was adopted by their European neighbours. It was to a Spaniard however that the merit of the invention is due; for Columela seeing wild sheep brought from Africa to Cadiz, for the sports of the amphitheatre, was first struck with the idea of mixing them with the Spanish breed, to improve it; and he succeeded by previously taming them, and adding them to their own flocks. This was the origin of the first improvements of the Spanish breeds; and by the introduction of the Vicuña, to cross with our own, which we shall, in due time, more fully notice,

what wonderful improvements might yet be made.

This glaring neglect, to which we have just alluded, is even remarked in the Spanish breed of sheep, that have been successively carried over to South America, where they have procreated with such rapidity. The quantity of common sheep's wool, packed in seroons, that has, within these few years, come into our own markets, evinces, from its dirty state, the careless manner in which the sheep are shorn; they are not previously washed, nor is any care taken, to extract the burrs and thorns, that have got into their fleeces; and this is, because the shearing of them, has always been considered as a secondary object. This wool was formerly left to the Indians for their own cloathing, and it has only been within these late years, that our speculators in that country, in want of returns, have laid hold of this article as a remittance, in hopes that the great demand in Europe, would render its quality less exceptionable. The common sheep, have like the Alpacas, now also nearly become black; for the skin of this animal in the wool, is only prized for one purpose, viz. to make *pellones*, or a kind of saddle cloths, placed on the seat of the rider; and it being the fashion only to use these black, added to the moun-

taineers preferring this colour for their blankets and friezes, the white breeds have gradually disappeared, and scarcely any other than blacks have been left. Yet even this source of industry put under proper regulations, is susceptible of great improvement, and if the energy of the country is but called forth, proportionably as it has been, for the last fifteen years, their own manufactures will suffice for their consumption of coarse woollens.

The art and ingenious enterprize of man, has at different periods, made admirable improvements on the productions of nature, and from their diversifications, has often raised their value. The mixture and alloy of metals, constitute the composition of others of more use in society than each in its separate state; and the engrafting of trees, by which the fruit is improved, are all the efforts of his ingenuity, in which nature has no part. In a similar manner and for the same purposes, has he been led to cross the breeds of animals, by which he has obtained an intermediate, or hybridous offspring, more useful than either of the parents in their natural state, and more conformable to his wishes.

In Europe it has hitherto been thought impracticable to cross the respective breeds of Pe-

ruvian sheep, but this is by no means a new discovery in upper Peru.* The different results, made by way of experiment, have tended to prove, that the mixture of the Vicuña with the Guanaco, has injured the wool of the former; it has rendered the fleece more hairy and longer. This has been equally observed of these animals in their wild state, so much so, that the Indian hunters have been obliged to make an abatement in the skins they have brought in, when they have proved not to be the real Vicuña.

The fleece of the Alpaca, which is not of a firm texture, is strengthened and improved by the mixture of the Guanaco, and for this breed, the male of the latter species is preferable. The Llama crossed with the Guanaco, betters its wool, and the Indian Llameros prefer this hybridous offspring, from the young ones partaking more of the vigorous properties of the wild animal, being equally strong as a beast of burden, and not so dull, sluggish, and capricious, as the pure Llama often is. It is however dangerous, at one season of the year, to put a male Guanaco, into a herd of male and female Llamas, for from being more active, vigorous, and fierce, dreadful feuds and battles occur with the latter

* Semanario de Buenos Ayres de Agricultura, Industria y Comercio. 1804.

males, in which the Guanaco is always victor. As the greatest material objection in the Guanacos to cross, is overcome by habituating them to the same range, when an union is projected, the male Llamas must for this reason be separated.

It has besides been experienced, that the Guanaco, though of a bay colour, crossing with a white female Llama, produces an offspring, nearly of the hue of the mother; and in the second generation, besides being perfectly white, the wool has been considerably improved in fineness.

In Chili it has with frequency been found, that by mixing the goat with the sheep, the fleece has resulted, of a long, lank, lustrous, and consistent quality, and when woven, has greatly imitated the finest Camblet. The intention of this, was originally to avoid the tedious process of platting the sheep's fleece on the skin, to make it suitable for the *pellones*, or saddle covers, and the experiment succeeded beyond expectation. This is a raw material worthy of some notice; as what we procure from Turkey, is generally in yarn, the exportation of raw goat's hair being prohibited by a provident regulation, by them established, in favour of the many poor people, employed in its spinning.

NOTWITHSTANDING it is a principle of natural history, laid down by zoologists, that alliances are only formed by animals of the same genus, this by no means destroys our hopes, of crossing the Vicuña, with the large breeds of common sheep. The four species of those of Peru, have in general been represented as belonging to the camel tribe; but were this classification to be well investigated, it would be found, that they partake in an equal degree, of the properties of sheep; and that they are in fact, a delicate blending of both. The Vicuña, is however, by far the most removed from the camel, and in proportion as it recedes, it approaches the sheep.

THE Vicuña is not taller than the sheep of South America, particularly those breeds, that feed on the *punas*, or elevated country, nor the Lincolnshire, or other breeds we have in England, particularly those provincially called Foresters, as may be seen by comparing the proportions we have given of that animal, in our description; indeed, they are much smaller than the African, and many other races of sheep. They are, besides, equally lanigerous, they have the same dispositions, are possessed of the same timidity, and softness of manners, are equally harmless, and inoffensive, have the same

plaintiff tone of voice, besides many other characteristic traits.

The idea from being novel, will undoubtedly at first sight, appear to clash with our generally received notions, respecting Peruvian sheep; but this is because they have been misrepresented to us, for the descriptions of some authors, have led us to believe they were a race of Camels, and those of others, that they were rather analogous to Horses. Yet nothing is more fallacious, nothing is more opposite to their real character. The Spaniards from the moment they entered Peru, denominated them, *Carneros de la Tierra*, and the Indians called those brought from Europe, Llamas. Hernandez uses the term, *ovis Peruana*, Gesner that of *ovis Indica;* and Linnæus appears to be the first, who gives them the classification of *Camelus*. They have indeed some of his distinctive marks, such as the fent lip, retromingency, long thin legs, cleft feet, rumination, similar attitudes, &c. not that we think, that any union could ever be promoted between even the Llama, which is the largest, and the Arabian Drudge; for the latter is a monster when compared with it. Were we however, to change the scale of contrast, we should find equally as many, or even more traits of alliance

with the sheep, which in the Vicuña, are nevertheless the most prominent.

They are in the first place, as before remarked, equally lanigerous, for wool is the prevailing coat of the Vicuña, notwithstanding it is in some places mixed with hair. This does not amount to a distinction, as it occurs in the same manner, in the best Merino breeds transferred to the temperature of the torrid zones, and is lost, when they are returned to a climate, more moderate and equal. The fent lip which constitutes the greatest variety, is scarcely visible in the Vicuña, the spurs on the cleft feet amount to none, for they are in like manner found in some races of sheep, such as are known at the Cape of Good Hope; and Pennant, vol. I, plate 36, has given us the drawing of one.

The Sheep and Vicuñas have besides approximate habits, and dispositions; both equally threaten with the foot, both abstain from drink, and go with young the same length of time. The Llama tribes have indeed no horns; but this is the case with many races of sheep, such as the *ovis Anglica* (Lin. Sys. 97) common in Lincolnshire and Wales. The Vicuña has also six inferior incisors like the Sheep, and not eight like the Camel.

When the Vicuñas are closely pursued, they do not run in a straight, progressive line, but rather in an oblique direction, as it were from side to side, a peculiarity remarkable in wild sheep, and Pennant says, demonstrative of their nature. They ascend the mountains with great agility, tread with security the narrowest paths, are sure-footed on the most rugged and dangerous precipices, and have many other traits of activity, that are by no means indicative of the Camel, but rather of the Goat, or of the *Mufro* of Corsica. Like them, they can be shot only by stratagem, and by the hunter coming on them unawares. They are uncommonly fond of salt, and have their licking places. The construction of the mouth is like that of the animal above mentioned, they clip the short grass in the same manner, and incline to the same kind of food. Even the physiognomy of the Vicuña, resembles that of the lamb, and when eating, the action of the mouth is similar.

Buffon says, that the Camel and the Dromedary herd and intermix, and that the offspring produced, is more vigorous than the parents. It has also been proved that the Goat and the Sheep will cross, as also the Dog and the Wolf, and if we recur to the examples we have amongst ourselves, we shall find, that there is more disparity

between the Horse and the Ass, than between the Vicuña and the Sheep; nor do we foresee any instinctive or material impediment that could operate. The Vicuñas would not copulate with the Sheep, if their own species were present, but accustomed to be folded, and herded together, from the age of two months, without any further intercourse with their own kinds, they would without any repugnance procreate; for the impulse of nature at the genial season of the year, which is extremely powerful in all the Llama tribes, would actuate them to the conservation of their own respective species, and overcome those repulsive ideas to an union, which arise more from difference of shape, size, deformity, and a want of familiarity, than from any instinctive objection. This is the opinion of some of the most intelligent economists of South America, amongst whom we may mention, the learned Dr. Funes, secretary of the Junta of Buenos Ayres; but we regret that several memoirs written on the subject, have not yet reached us, as well as the results of some experiments made.

The crossing of the breeds of Peruvian sheep, respectively, is an idea equally novel in Europe, though it has been so long proved in South America; and many of our own country-

men had the fullest testimony of its success before them, during the time they held the town of Buenos Ayres. As these particulars are connected with our subject, we will beg leave to introduce them by a short digression.

In the year 1804, the Prince of Peace, as minister to the court of Spain, had been solicited by the ex-empress Josephine, whose taste for plants, and curiosities of natural history is well known, to obtain varieties of the four species of Peruvian sheep, and in conformity to this request, orders were issued to the viceroy of La Plata. In the year 1805, about twenty-five of the finest specimens that could be obtained, were brought down in caravans, from the Cordilleras of upper Peru, for being destined to be presented to the then empress of the French, in the name of their catholic majesties, they were not trusted to the more precarious conveyance of water, and no money was spared on the occasion.

In consequence of the war between England and Spain, these animals remained at Buenos Ayres, and being kept in inclosures, without the town, they crossed and intermixed respectively, producing several intermediate species, that always partook most of the mother; but the fleeces of this offspring, were considerably bettered. The white Guanaco, to which we have before

alluded, from being so ungovernable, and kept in a separate fold, was the only one that did not copulate; but those of his own species that had been taken young, and gradually tamed, were led to alliances, that did not in the least seem uncongenial.

In the capture of that city, by the British arms, in the year 1806, these animals were taken; but what appears the most unaccountable, is, that they were not sent to England, nor do we find there was an individual in the expedition, or amongst the merchants who so soon afterwards flocked in, that had sufficient curiosity to preserve the particulars, and obtain drawings, though we have met with several persons who visited them. What a great loss it is to the public, as well as to the cause of science, that civil commissaries andmen of literary talents, are not attached to expeditions of this nature, destined to a foreign and unknown country, and that persons are not sent capable of topographical and descriptive researches. The English and French expeditions to Egypt, will in future ages, be remembered by the man of science, from the knowledge of that occult country we have thence acquired, and unless the protection of government seconds the exertions of individuals, South America will be as much unknown

to us, as it was when we were excluded by the Spaniards.

During the attack by General Whitelocke, some of these animals were killed in the fire of the army on the suburbs, and others were dispersed; but after the evacuation, being collected, and a change of Spanish politics afterwards succeeding, they were sent by Liniers over to the central Junta at Seville, where they were, at the capture of that place by the French. It is presumable that they soon found their way to Paris, to grace the Imperial menagerie, the object for which they were originally destined, but in the particulars we have obtained in writing from persons attached to the present government of Buenos Ayres, we have not been able to trace them farther than Seville.

Madame Bonaparte, had previously, in the year 1800, added to her collection at Malmaison, a pair of Llamas, sent over by the colonial prefect of St. Domingue, to which latter place, they had been forwarded as a curiosity from the Spanish main. They underwent the fatigue and privations of a sea voyage very well, and after landing in France, enjoyed good health. La Menagerie du Museum National d'Histoire naturelle, (1801) has given two drawings of them, together with some descriptive particulars,

but besides being confined to the Llamas, these do not amount to more than detatched remarks. The authors of that work are of opinion that it is easy to inure them to the climate, and that as their food is simple and common, and the animal besides hardy, no difficulty whatever would be encountered in their naturalization. The French have also the example of another Llama, living five years amongst them.

The assertions of Ulloa, as well as the results of some experiments made in Spain, to naturalize the Vicuña, can have no reference whatever to attempts made to bring them to congenial climates. It is natural to suppose, that they would not answer in the sandy and hot plains of Spain, where the climate and food are adverse to them. It is not to be expected, they could thrive, in an atmosphere too dense, and too much heated, for the delicate structure of their lungs, but the mountains of Wales, and those of Cumberland, where there is abundance of moss, would constitute a congenial climate, as well as almost all the downs we have on our Northern sea coasts. The Pyrenean and Alpine mountains of the continent, would afford them suitable ranges, and we can aver from the authority of its keeper, that the Vicuña belonging to Mr. Polito, in Exeter 'Change, alone, confined to a room, and

in the centre of London, has not had an hour's sickness since it arrived; and the Alpaca and Llamas, to which we have had access, and taken pains frequently to notice, have uniformly appeared as lively, and in as good health, as they are in Peru.

A sudden and total change of aliment, possibly entirely opposite, even in man, frequently produces the greatest change; it is therefore natural that the same should occur in brutes, accustomed to be nourished with only one kind of aliment. It is frequently seen, that the Vicuña brought down to Lima, and other parts of lower Peru, as a pet, dies as soon as the heats commence; but why? Because it is there in a climate opposed to its nature and habits; because bread, cakes, chocolate, and other uncongenial food is given it; it is kept under cover, it pants not so much after its native mountains and liberty, as after the society of its own species: but reverse the whole, and place it in that sphere for which nature destined it, and its naturalization would not be found difficult.

An objection, that has been raised against the possibility of domesticating, and naturalizing the Vicuña, is,—that those which have been raised in towns, have died of a cutaneous disorder, that has broke out all over them. The

fact is, as we have before noticed, that the experiments, hitherto made, have been confined to a few solitary instances, in Vicuñas that have been brought down from their native mountains to the towns, to be the pets of women and children (an object for which their docile and soft manners are well suited), nor must it be thought singular, that in South America, these experiments have not, before this, been fully made. Besides a want of enterprize, and of that rivalship, which can alone carry manufactures to a great length, in addition to its having been the uniform policy of the old government to discourage ultra-marine manufactures, in favour of their own in Spain, wool has been an object of little or no value, it has been left to the Indians, and of consequence, its improvement has been neglected. The domestication of the Vicuña, as well as the crossing of the breeds, and the sorting and stapling of the wools, previous to their embarkation, are objects that deserve the attention and support of the government of the country, and ought for a limited time, to be confided to the exclusive charge of incorporated companies. If we may judge from the general measures adopted by the Junta of Buenos Ayres, and the improved state of the country, as well as from the opinions of several economists, collected from

public prints; as soon as tranquillity is restored, these interesting objects will be attended to, and the patriotic endeavours of the government will be devoted to them, as well as to many other branches of rural economy, that will add to their territorial productions.

As we have before observed, the naturalization of the Vicuña depends on the climate to which it is carried, and the diet placed before it; for even in cases where this eruption or mange has occurred, they have easily recovered, on being shorn, bathed, and kept cool, and have lived several years afterwards. That they become sad and melancholy, is the natural effect of their seclusion, and of that want of congenial exercise, to which they have been accustomed. This must naturally produce sensible alterations in their physical organs, but this as we have before established, is all within the reach of an easy remedy.

In the year, 1806, it was observed by a Peruvian of one of the lowland towns, that a young Llama, in his possession, perspired very profusely, as soon as the heats commenced, and that a scurf formed on the skin. On having it shorn, and bathed, in the early and cool part of the day, before the system of the animal had been heated, either by exercise, or the natural

warmth of the weather, it recovered; whilst it was, at the same time, experienced, that others in the herds, when afflicted with the very same disorder, died, if a similar expedient was not resorted to. It would therefore result, that the very object, which would render these animals so desirable to us, viz. to obtain their fleeces, would be of essential service to them, would help to preserve their health, would act as a remedy, which they themselves naturally seek; for when taken down to the heated atmosphere of the plains, and when this rash breaks out, under the weight of their natural wool, they instantly and instinctively seek the cooling stream.

That great variety of surface, as well as climate, that presents itself in the interiour of Peru, and Buenos Ayres, united with the nature of the soil, afford the most suitable localities for the breeding of these animals in tame herds. Congenial ranges, of hundreds of leagues, extend useless and unnoticed; where a few solitary Llamas, are all the Indian raises, to go in search of salt, or to carry his grain to the mill; with the addition of a few sheep, which he kills, and salts, for the sustenance of his family, converting their fleeces into coarse cloathing. The economist reflects with regret, that the declivities of Tucuman and Humaguaca, are neglected, though they af-

ford such a commodious conveyance to Buenos Ayres, and that a source of wealth, as valuable as their mines, is unnoticed and unimproved.

Ever since the time of Buffon, the introduction of the Vicuña into France, has been a favourite scheme, and in the supplement of the natural history of that author, *(ad verb. Vicuña)* is inserted, a memorial of the Abbé Beliard, in which he advises the ministry to employ a commercial house in Cadiz, to obtain them in their ships from the river of Plate; by giving orders, to have them first brought down from *Santa Cruz de la Sierra*, where three or four dozens might be obtained.

It indicates however, a great want of knowledge of the situation of the country, and of the animal, to suppose that in its wild state, it could be brought to Europe. It must, in the first place, be domesticated on the spot, and even previously accustomed to such a kind of food, as can be conveyed on board of a ship, for its sustenance. In that way, with ease and no great expence, might we ourselves obtain them, and it is thus we may expect to improve our English and Spanish breeds, and double and treble the value of our wool. It would be easy to bring an intelligent Indian over, accustomed to handle them, in the same way that we have brought

over Spanish shepherds, whose services might at first be useful.

This is an object deserving of the patriotic endeavours of a nation, that has done so much for the improvement of its wools, and that builds so much of its national prosperity on this branch of rural economy. According to the present state of things, we do not so much want an increase of quantity in our wools, as we stand in need of an improvement in quality, and this can in no way be so well effected, as by crossing with the Vicuña. Every intelligent manufacturer knows the appreciation of this fleece on the continent, and the natural mixture would be more valuable than the same in its separate state, for it would destroy some objections alleged against cloth of entire Vicuña wool; and even the bay colour, as proved with the white female Llama, would in the second generation, in all probability, be lost.

The reclaiming of this animal from a state of nature, will, as before noticed, ere long be an object of consideration in South-America; but in the mean time, a very partial effort would procure a sufficient number, to be brought over as a beginning, in order to realize the experiment. This would be attended with a double advantage, viz. that of having the finest wool-

bearing animal in the world amongst us; and secondly, that of crossing with, and improving our own breeds. We might also anticipate a considerable melioration in the natural fleece of the Vicuña, for as hair is the result of the climate, and the effect of heat and perspiration, when the animal was once removed to a more equal and moderate temperature, added to more suitable pasture, the hair would diminish, or totally disappear; as has been fully proved in sheep, taken to the tropical regions, which on being again brought back, have recovered that entire woolly coat, which they had, during their absence lost. It is even found, that any of the four species of Peruvian sheep, placed under the genial influence of an equable climate, such as is found in some parts of lower Peru, not too far removed from the Cordillera, nor too near the low and burning sands of the South sea shore; but in those middle climes, where the extremes of heat and cold, are equally unknown; their wools considerably improve, the fleeces become less shaggy, but not so abundant; and we have remarked of the Llama exhibited in Piccadilly, that its wool is finer, since its importation; so much so, that to the touch, no difference was sensible, between a sample taken from its back, and one extracted from a seroon of Vigonia.

Every one is aware, what a powerful rival France is, in the manufacture of woollens; and to what an extent she formerly supplied other nations. From the state of war we have been in for so many years, which has in some measure effected her exclusion, many nations have been induced to wear our goods, which before were not accustomed to consume them; but this has not been from preference; and if ever a peace establishment arrives, in most probability, they would return to their old channels, if a degree of rivalship, in point of quality, were not produced. The woollen trade to Turkey, and to the Levant seas, is one of our most valuable branches of export, and to the consumers of those warmer regions, nothing could be more desirable than woollens of a soft, fine, and light texture, such as the mixture of the Vicuña would produce, and it would be even a means of their being sought in France. Ladies' cloths made of it, would be highly estimable, nor is there, at this moment, a present more acceptable to a Turkish bashaw, than a piece of fine Vigonia cloth, nor any thing more prized in South America. By the custom-house statements, our exports of woollen manufactures, in 1810, amounted to £5,773,214, which at once evinces, what an important branch of national wealth they constitute; and the car-

rying them to a higher pitch, than they have yet attained, is not only to add to the employment of a number of hands, but also to increase our balance of trade; and we may rest assured, that nothing but inability hinders the naturalization of the Vicuña into France, and the improvement of the valuable resources, to which it would lead.

Either as subjects of natural history, as ornaments to our parks, or as valuable wool bearing animals, the whole four species of Peruvian sheep are interesting; more especially the Alpaca and Vicuña, and there cannot be a doubt of their wools considerably improving, by their introduction amongst us. The collection of subjects of natural history, is by no means the fashion in England, though in France it merits the warmest protection of government, and the aid and concurrence of men of science. Amongst us, it is left to the partial efforts of a few speculators, as a means of subsistence, and the dens and conveniences of the Tower, are useless and unoccupied. But besides a want of national taste, the difficulty of landing, and the indefinite manner in which custom-house duties are exacted on imported animals, act as a considerable impediment to their being brought amongst us, and this, added to the delay and difficulty of getting

them ashore, often prevents captains, when abroad, from troubling themselves to give them passage. The known subjects of natural history are not so numerous, that a tarif might not easily be made, and the duties on each specified, which paid, the animal ought to be allowed to land; for there have been instances of many days being expended in formalities, that after a long passage, might endanger the life of the beast; but again there are many, that ought to have premiums given for them, amongst which the subjects we have described are the foremost.

We have seen a premium of £6000 offered for the introduction of the cochineal into the East Indies; every one is aware of the immense expences at which the Bread-fruit was sent to those of the West, yet this, to which we allude, is an object, that in point of importance bears no kind of comparison, it is a new germ of commerce and enterprize, for which we shall be entitled to the thanks of posterity.

PARTICULARS

Of the various Kinds of Wool imported from South America; with general Ideas of their applicability to manufacture, as well there as in Europe; to which are added additional Remarks on the Dyes used by the Indians, and their Progress in Manufactures.

THE different kinds of South American wools, that have been imported into this country, by merchants and manufacturers, have been classed under the following heads; but on their application to manufacture, they have been found most beneficial in the branches of trade, to which their consumption is affixed.

THE common Sheep's wool of South America, is the production of the Spanish Sheep, that have been taken over to that country, where they have multiplied to that great degree, that, as we have noticed, in the body of our essay, they can be bought in the interiour, at the low price of one dollar, and in the sea-ports, at three. The fleece of this animal serves to protect the Indian from the blasts of his wintery atmosphere, and its flesh

affords him sustenance. This valuable race of quadrupeds, has spread in upper Peru, as the horned cattle have done on the *pampas* of Buenos Ayres, and each has chosen its most congenial range, and most suitable pasture. The Sheep, as they at present exist in South America, have not altogether preserved the fine coat of their parent stock. On the plains, and in the lower and more heated regions, long distinct hairs out-top the under wool; which is nevertheless least observable in the Sheep of the *punas*, or those tracts, which range at the foot of the mountain snows, where the climate and pasturage are most favourable; but the wool from these quarters never comes amongst us, from the great length of the land carriage; yet this race is the largest and most vigorous.

The inferior quality from being most handy, is what has been shipped to this country, and the rest is consumed in the interiour. The black breeds are the most encouraged, for reasons already explained, and in some parts no others are thought of any value. This denomination of wool, is considered by our manufacturers as very inferiour, being coarse and hairy, and partaking of the nature of that of the Barbary Sheep. It is uesd in making lists for broad cloth; but even for this, it is objectionable, from being of a

felting nature, that is, in every process of the manufacture, it contracts, and causes the cloth to *cockle*. It is best used in blankets, carpets, and other coarse articles. The American Spaniards use it for mattrasses, for the manufacture of *ponchos*, baize, friezes, &c.; and on an annual average, besides their own consumption, 12,000 varas of Quito cloths, go by the way of Arequipa to the provinces of Buenos Ayres, valued at eighteen rials per vara; besides 1,000,000 varas of baize, at four rials, by the way of Cusco, and about 500,000 varas of coarse serges, are returned every year from Buenos Ayres to Peru; but Quito and Cusco are the greatest manufacturing places for woollens, as Cochabamba is for cottons.

Wool, under the denomination of which we treat, is brought to this country in a greasy state, as taken off the back of the Sheep, and packed in seroons, or packages made of bullocks' hides, which being put on wet, and the wool well beat in with mallets, on drying, they become the hardest and most compressed packages, that circulate in trade. This wool is, as before noticed, extremely greasy, from the profuse perspiration under which the animal labours, owing to the heat of the climate, and the weight of its fleece, which on an average, may be calculated at one

third more than it is in Europe; and as our importations of this article, have been only from Lima and Buenos Ayres, we have given the reasons why it is most inferiour. From a great want of sorting, and stapling, before it is shipped, besides the expence of scowering, and picking out the filth with which it is clotted, one half of the weight is lost; on which the importer has paid freight and double duties, and on which the manufacturer has paid carriage, before he gets it to his works. Till another system is adopted by the growers, the importation of this description of wool can never answer; the freight and charges absorb the capital; for in its dirty state, at present, it only sells for about 6d. per lb. We have not been able to obtain from the Custom-house an exact return of the different kinds of wool, annually imported from South America, owing to the fact of their all paying the same duties, viz. 5s. per cwt. and 1s. 8d. temporary, or war duty, in British vessels; but the following is an account of all sorts of Sheep's wool, imported into Great Britain from Spanish America, in the last four years---

	Cwt.	qr.	lb.
1807.....	546	0	24
1808.....	352	1	21
1809.....	641	1	11
1810.....	653	0	23

Alpaca wool is shorn from the animal of that name we have described, and on an average, from the reasons we have assigned, nine-tenths of it are black; the residue, partly white, red, or of the colour of Vicuña wool, and some grizzled; but Azara however remarks, that in some districts, these animals are entirely white. The wool is of a very long staple, often reaching to twelve inches, inclinable to curl, and partakes greatly of soft, glossy hair, which appears to emerge in longer and distinct flakes, from being straighter than the under wool. It is not of that felting nature common to other wools, from the great elasticity of its fibres, and requires a very nice preparation to enable it to receive colour; which is done by washing it with boiling water, and by immersing it in absorbents, to divest it of every oleous particle. It is however by no means greasy, and being in general extremely clean, of consequence loses little, in the process of manufacture. It is extremely soft and silky to the touch, and when dyed, it loses nothing of its singular gloss; the carders however complain, that it breaks in combing, which is possible, from its great length and extreme fineness.

From its novelty, and the superabundance of other wools, its manufacture has not been yet much experimented upon in England, for even

in South America it is made up into a greater variety of articles, and of finer texture than in this country. They there manufacture it into cloths, camblets, serges, hair ribbon, of which the Indian women plat a great deal into their locks, into blankets, rugs, and carpets of a very superiour style; and even in Germany, they weave it into a species of fine camblet, in imitation of what the Spaniards call *Barraygan*, that from its close texture, and natural gloss, expels rain; and this would certainly be a variety well deserving of the adoption of our looms. It also appears well suited for all kinds of hosiery, saddle cloths, &c. and for a variety of finer textures. The Alpaca wool formerly brought to Cadiz was sold to the North of Europe, and to France, a very small part being manufactured in Spain; but it is only within three years, that in England it has been in any way applied to spinning; yet, as we have before pointed out, a beautiful snow-white race can be obtained, and hence its introduction amongst us, would deserve particular encouragement.

GUANACO wool is obtained from the wild animal of that name, and is shorn off the skin, as the hunter brings it in. The wool is nearly of the same nature and colour as that of the Vigonia, with this difference, that it is coarser, shorter in

the staple, and of a lighter colour, that is, not so red; particularly the longest parts, which are taken from under the belly and flanks. It is also much more filled with hair, which renders it infinitely less valuable; and this occurs not only from the more shaggy state of the Guanaco's coat, but also, because under this denomination is included, wool shorn from the Llama, as well as the coarser particles rejected from the Vigonia seroons, they being all blended in one indiscriminate package. What again renders this wool more objectionable, is the scurf and dirt it is found to contain; indeed that of the Vigonia, is the only species with which any pains are taken, and that undergoes the process of sorting and stapling.

Its being mixed with scurf, we conceive must be owing to the animal being shorn out of season, or when unwell; for we have before mentioned, that all the four species of Peruvian Sheep, in the heated climate of the lowlands, are subject to the scab. Many reasons concur to prove, what care ought to be taken to shear all wool-bearing animals in the proper season, for the fur seals, for instance, taken in the South Seas, are at some periods of the year, shedding their coats, that is, they are casting the outward hair, which covers the fur, and if killed at that time, the skin is not

half so valuable, as when in season; and even amongst ourselves, the skins of the rabbit and hare are not half so estimable when killed in summer, as they are in winter. The scurf and hair that occur in the wool of the denomination to which we allude, and which is nevertheless naturally fine and soft in the staple, renders it of considerably less estimation, as it is previously necessary to sort and pick out the best quality, which is employed in the manufacture of hats, the refuse being left for list wool. It in general sells from 2, 3, to 4 shillings per lb. according to the demand, but is capable of being much improved in quality, by being stapled, previous to its embarkation. The Indians of the interiour, employ it in the manufactures of ponchos, blankets, rugs, &c.*

Deep Vigonia, or red wool, is from its fineness, and soft silky nature, the most valuable fleece produced from any animal in the world. Those of Caramania were generally considered in the first light, and they were for that reason,

* In our description of the Guanaco and Vicuña, we omitted to mention, that Axara notices, that in the wild herds, there is a greater proportion of males than females. This we conceive must be owing to their having been more successful in escaping than the latter, for the males, from being stronger, fleeter, and less timid, must have the best chance of evading the pursuit of the hunter.

reserved for the uses of the priests; but the Vicuña wool was in like manner, monopolized by the Incas. This species confessedly exceeds the preceding, surpasses that of Cachemire, or the Lamb wool of Bucharia; and is better suited to the manufacture of fine shawls, than any of the wools of Persia. A quantity of what is denominated Camelia wool, was imported into England by the East India company, seven years ago, but it only sold for 3s. 6d. per lb. and from having both scurf and hair in it, was not suited for the manufacture of hats. It was perhaps shorn at an unseasonable moment, for had it been divested of those two objections, it would have been worth 10s. to the hat trade, or of an equal value with Vigonia.

The only objection that can be brought against the Vigonia, or red wool, is its colour, which prevents it from being introduced into light coloured, and fancy cloths, shawls, or ladies' habit cloths, for which it is admirably well-suited. The dyers of this country, have not however yet found out the secret of giving it colour, for besides black, we have seen both the Vigonia and Alpaca wools of a brilliant scarlet hue, and of the latter we are even possessed of samples. We presume nevertheless that both were from white wools; but the Peruvians even

give that which is red, a black colour; as is in a most conspicuous manner evinced in their hats, which could not be surpassed in Europe, and of which we can produce a specimen.

VIGONIA wool is more generally used in France than in England, and consumed in larger quantities both in the hat and cloth manufactures; but the mode of making hats in that country is like the method pursued by the manufacturers of Lima, that is, they make them of a very close texture, but without any covering or nap, consequently they never have a glossy hue, which not being considered essential, they are enabled to introduce an extra quantity of Vigonia wool into the hat, which makes it so durable, that one of this nature, might descend from father to son, and scarcely ever be worn out.

THIS denomination of wool, possesses in an extraordinary degree, the virtue of cementing together the other articles of which the hat is composed, or what in the trade term is called felting. In a light gentleman's hat, is put one quarter of an ounce, which being worked into the inside, renders it a valuable acquisition. A great obstacle however to its more general use, is the extra charge which the workman claims from its being more troublesome, and because it renders the hat too good and durable, for it is now fash-

ionable to wear two, or more hats a year, whereas one made of a greater proportion of Vigoñia would suffice.

THIS wool has also, with the greatest success, been manufactured into shawls, some of which were worn by ladies of rank at the trial of Lord Melville, but the colour was some objection to their more general use; yet even in the manufacture of this article, the Peruvians excel us. The casimeres made of it, were for this same reason not brought into fashion, but should the white breeds ever be introduced and encouraged (and as we have before evinced, they are attainable if proper measures are only taken,) we may then boast of having the most valuable wool-bearing animal within the reach of nature amongst us, and our expenditure for this article of luxury, instead of going to the East Indies, may be retained at home. The value of this wool in its clean state, has often been a guinea per lb. and in France, where its manufacture has been more attended to, it now sells for nearly twice as much.

THE Vigonia wool is the most sorted, and culled in South America, of any article shipped from that country. The common mode of packing it, is in seroons made of bullocks' hides, and it is in this way, that tallow, indigo, cochi-

neal, *nutria*, skins, &c. are sent over; but this wool is previously packed in bags, made of Hessians, manufactured in the country, the locks are placed in layers, with a degree of care, and then the whole is put into a hide, made into a seroon. The manufacture of this kind of wool into cloths, and stuffs, was known to the ancient Peruvians, and they still continue it, with many European improvements; but they are so much more in the secret of dyeing, in which we may be considered behind-hand, that we cannot but add a few particulars respecting some ingredients unknown to our manufacturers, well deserving of their adoption, and that have been particularly treated upon by Don Tadeo Haenke, in his Natural History of Cochabamba.

NUTRIA skins, are obtained from an amphibious animal of South America, supposed to be of the otter tribe, owing to which the Spaniards denominate it, *nutria*, which means, otter. They were first brought from Cadiz, to this country, ten years ago, and when offered for sale, were called monkey skins, from their great resemblance to the small races of that animal. The Indians call them *guiyd*; and Azara* says, that they do not pass the 24th degree of latitude, towards the

* Vol. i. p. 308.

north, but in the whole of the province of La Plata they are found in very great abundance, in the lakes and rivers. They burrow in the banks, where they bring forth from four to seven young ones, and have the peculiarity of their teats being placed on each side, near the back, as if to suckle their young whilst swimming in the water. The common food of this animal is grass, and the length of the body about twenty-four inches, besides the tail, which is sixteen inches long, scaly, thick, but divested of hair. Its legs are short, and its motion heavy. It has five toes on each foot, connected with a membrane.

A considerable quantity of coarse hair outtops the soft fur, which is underneath, but being extracted, the under down is applied to the manufacture of hats, though not so valuable as that of either the beaver, or the real otter. In 1808, these skins sold at 5s. each, but this value, attached to them from their great scarcity, and novelty, caused so many to be sent over, that they are not now worth more than 9d.; indeed it is thought that there is a million of them, on hand, in this country. They pay an *ad valorem* duty, that is, if the merchant values them at 6d. the custom-house adds 3d, and then the duty is charged on that rate. Their importation must

be attended with great loss, as they are often invoiced at four rials (2s. 3d.) to which the charges are to be added.

THERE is another, and more proper species of otter, the skin of which has not yet been brought to this country, as an article of trade, though much more valuable than the preceding. In the country it is wrongly called *lobo del rio* (river wolf) and it abounds in all the rivers and lakes of Paraguay, and burrows in the banks. Besides these however, there are several other animals, whose fur would be extremely valuable in various branches of manufacture, as they afford furs and ornamental skins, equal to the Chinchilla, particularly the *viscacha*, which is a species of rabbit, whose fur was spun for the clothing of the Incas.

THE seal fur, is produced from the animal of that name, and from being within very few years, used in this country, deserves a concise consideration. The seal, is found on the coasts of many parts of South America, and on the island of Lobos, situated at the entrance of the river La Plata, numbers are annually taken. A company formerly had the privilege of killing them on this island, and their returns for the two years under named, are as follows:

	1802.	1803.
Common skins dried	14,350	9,438
Large skins salted	3,416	2,113
	17,766	11,551
Barrels of oil	619	314

In this operation twenty-seven persons were employed; the season commences in May, and ends in November.

These skins are in general used for covering trunks, and a trunk-maker, of the name of Chapman, was the first who thought of extracting the long outward hair, and then the fur, by having the skin previously tainted. The fur, when well cleansed from the salt and dirt, has been applied to the manufacture of hats, and by way of experiment, has been spun, and made into cloth, of a beautiful, soft and silky texture, but from being of a very short staple, it can never answer the latter purpose.

Cotton wool, which from being a vegetable production, is not strictly connected with our subject, is however an article of such value, that a small digression will be pardonable; particularly as it will afford us an opportunity of adverting to the manufactures of South America, a subject little known amongst us.

The state of war, in which South America has been kept for the last few years, and the dear rate at which its inhabitants have been obliged to purchase most of their necessaries, has served to rouse the efforts of many in the erection of manufactures, as well as in the furtherance of agriculture. The articles of cotton have particularly been improved, and even gauzes have been manufactured. Tucuman and Cusco have carried their baizes and other woollens to a degree of perfection, as well as Cochabamba its cottons; and hats made of Vicuña wool, might as before noticed, compare with the best French or English beaver.

A late South American writer, speaking of the manufactures of that country, says, that they are under the greatest obligations to the English, for having taught them how to supply themselves with cloathing, and for introducing amongst them a spirit of industry. This is evident to every one, who has marked the rising growth of that country, which has advanced more within the last twenty years, than it did in the two hundred preceding, and the war, with its accompanying privations, has been the principal stimulus.

Cotton may be considered as one of the most essential productions of the southern continent, and as constituting a material part of the con-

venience of its inhabitants. The regions of Asia cannot be said to surpass those of South America in the production of this vegetable wool. All those provinces comprehended between the two tropics, are suited to its growth, and the quality raised, may be compared with any. Indeed the particular formation and nature of the soil, as well as of the climate, may be said to be more congenial, than those of the East Indies; for the Andes mountains and their declivities, present localities that may justly be termed garden spots; half the year there alternates with rain, the same as in India, whilst the other leaves a reasonable period, for the fruit to grow ripe, without which the bud could not be formed.

A still more striking advantage is the possession of extended ranges, that bear in their soil sufficient moisture, without rain ever falling; for unseasonable showers not only tend to rot and destroy the buds, but any moist particles lodging therein, give the cotton a black colour, and injure the staple. Such are many of the lowlands of Peru, where the vine, olive, and cotton plant, are equally luxuriant, for in the latter, no intermission to flower and to produce is noticed.

With such natural resources, and with forests teeming with vegetable and mineral productions,

suited for dyeing, added to the characteristic patience, and sedentary disposition of the Indian, who though not inventive, yet partakes greatly of the imitative genius of the Chinese, what favourable changes may not now be expected, under the administration of a new and vigorous government, with all the old monopolies and prohibitions cast to the ground. Haenke says, that notwithstanding industry is in a state of comparative infancy, it is yet much more advanced than we are aware of in Europe, and this is a fact, that has been forcibly felt by our adventurers to that country, who have been as ignorant of its state, as were those who publicly misled them.

The town of Cochabamba alone, according to the above respectable writer, annually consumes in its manufacture of coarse cottons, a million pounds, and its looms have constituted a considerable resource to the surrounding districts, during the war. The provinces of Peru, besides their own consumption, send annually to those of Buenos Ayres, by the way of Cusco, 200,000 varas of *Tucuyos*, or a species of Bafras, suited for Indian cloathing, valued at three rials.

Nor is this spirit of enterprise and industry confined to those regions the longest settled. The Moxos Indians, occupying that extent of country

N. of La Plata, between 11, 12, and 13 degrees of latitude, and 305 and 311, longitude; tribes that have so lately emerged, as it were, from the wilds, manufacture cottons of a stout and consistent nature; samples of which produced in England, have astonished the manufacturers; and it is a fact of which at a future day, we shall be more sensible, that the late war has taught the inhabitants of South America that they are capable of supplying their own wants, and that our present apathized policy will lead them to rely more on their own resources, than on the friendship and supplies of distant powers.

Though the limits of an essay of this nature, do not afford room for long details, yet we cannot forbear mentioning a few new ingredieuts for dyeing, that merit particular attention; some of which have been more fully noticed by Don Tadeo Haenke, in his researches on Cochabamba.

It was not till the late war, that notice was taken of a green dye from a production called by the Spaniards *Clavillo* (or small nail) from its resemblance to one. Some assert that it is the excrementitious deposit of a small insect, and others, that it is the insect itself. It is found introduced, as with a point, into the outside bark of a shrub; and after Alpaca and Vicuña wools,

or cottons, have been boiled in a solution of yellow dye, and then cast into one of *Clavillo*, they acquire a beautiful green colour. It abounds in the valley of Catamarca, *Tucuman*, *Carquejia*, and many parts of upper Peru. The allum used by the Indians in their dyes, is found in its natural state in La Paz, and they find it extremely serviceable in fixing all colouring particles. Several species of sulfate of iron, are found in many places, and used for ink, for dyeing black, and some dark colours; besides valuable metallic salts.

WILD cochineal is found plentifully in Tucuman, and other places, but considerably inferiour to that of Mexico. The most common method of dyeing red, is by pulverising the stalks of a plant called Chapi, and it is found to take extremely well in wool. This invention of a vegetable scarlet colour belongs to the Indians; and from the cheapness of the plant, deserves notice.

The *rubia* TINCTORIA or madder, abounds in most of the forests, but the best is gathered in *Tarija*, *Chaco*, and *Sierra de Cordova*, and yields a brilliant colour. Several trees also produce a gum, in every respect equal to what is called Gum Arabic.

A good violet is obtained by a decoction of a species of *Cæsalpina Tara*, with a solution of

iron. Haenke says, it greatly approaches the *sapan* of the Chinese, and deserves particular attention. Several productions entirely unknown in Europe, afford yellow tints of great durability.

Amongst the other vegetables found in upper Peru, and worthy of being naturalized in Europe, is a potatoe, that yields a dark blue, and violet colour. It exactly resembles the one we have amongst us, and there is no doubt of its being equally congenial to our climate. Several new and interesting processes of dyeing, as used by the Indians, are detailed by Haenke, in his Natural History of Cochabamba, incorporated with Azara's works, to which we refer our readers.

The naturalist beholds with sensations of wonder, the numerous and choice productions with which nature has gifted the great continent of South America; the philosopher anticipates with the eye of futurity, æras very different to those whch have hitherto shrouded its neglected and oppressed regions; whilst the dawn that has already burst on its opaque horizon, is the surest prognostic, of what it will, in future ages, rise to be. If in the course of our little essay, we have for a moment excited the curiosity, and arrested the contemplation of a discerning public, towards a few of the productions, of which it can so preemi-

nently boast, we have gratified the only ambition of our heart; there possibly will be a day, when it will be more fashionable to think of resources, which we now seem to overlook, and when the state of South America will merit some political consideration. Every thing we have hitherto done, has but tended to alienate us from the estimation of its inhabitants, not one conciliating measure has closed the wounds that impolicy had opened; yet we cannot but express a fervent hope, that the South Columbians may never have to charge us with insincerity.

FINIS.

W. Glindon, Printer, Rupert-Street, Haymarket.

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